DISSERTATION ON
"A STUDY TO ASSESS THE EFFECTIVENESS OF NEBULISATION WITH POSTURAL DRAINAGE AND PERCUSSION ON RESPIRATORY STATUS AMONG CHILDREN WITH SELECTED RESPIRATORY DISORDERS AT INSTITUE OF SOCIAL PAEDIATRICS, GOVERNMENT STANLEY MEDICAL COLLEGE AND HOSPITAL, CHENNAI -1."

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CERTIFICATE

This is to certify that this dissertation titled **"A STUDY TO ASSESS THE EFFECTIVENESS OF NEBULISATION WITH POSTURAL DRAINAGE AND PERCUSSION ON RESPIRATORY STATUS AMONG CHILDREN WITH SELECTED RESPIRATORY DISORDERS AT INSTITUTE OF SOCIAL PAEDIATRICS, GOVERNMENT STANLEY MEDICAL COLLEGE AND HOSPITAL, CHENNAI - 1".** Is a bonafide work done by MRS. MONICA DEVI.K, College Of Nursing, Madras Medical College, Chennai – 600003 submitted to the TAMILNADU DR.M.G.R. MEDICAL UNVERSITY, CHENNAI. In Partial fulfillment of the requirements for the award of Degree of MASTER OF SCIENCE IN NURSING, BRANCH II, CHILD HEALTH NURSING, under our guidance and supervision during the academic period from 2011 – 2012.

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LIST OF ABBREVIATIONS

SI.NO	ABBREVIATIONS	EXPANSION
1.	WHO	WORLD HEALTH ORGANIZATION
2.	ISP	INSTITUTE OF SOCIAL PEDIATRICS
3.	PD &P	POSTURALDRAINAGE AND PERCUSSION
4.	BPM	BIO PHYSIOLOGICAL PARAMETERS
5.	SaO2	OXYGEN SATURATION

ABSTRACT

Acute respiratory infections are a major cause of morbidity and mortality in young children worldwide. They account for nearly 3.9 million deaths every year globally. Chest physiotherapy plays an important role by promoting drainage and ensuring normal lung expansion in parenchymal lung diseases and pleural diseases. Hence I was keen to evaluate the effectiveness of nebulisation with postural drainage and percussion on respiratory status among children with selected respiratory disorders like bronchitis, bronchiolitis, asthma and pneumonia. It was a quantitative approach , Quasi experimental study design used children (60) with respiratory disorders within the age group of 3-5years receiving nebulisation with salbutamol using convenient sampling technique. Respiratory status assessment of clinical parameters (Rating Scale) and Bio physiological measurements(BPM) was done. For experimental group- salbutamol nebulisation percussion and postural drainage for 6 minutes in 10 positions. For control group- salbutamol nebulisation alone given both morning and evening for 2days. Mean, standard deviation, t-test, pearson chisquare test is used for statistical analysis. In experimental group the respiratory disorder children are reduced their clinical parameter distress score from 11.33 to 4.17 . They are able to reduce 7.16 score from base line score. In control group 11.33 to 7.90 they are able to reduce 3.27 score from base line score. Regarding bio physiological parameter, the reduction is statistically significant (P=0.001***) in both groups. Thus the author concludes that Improvement in respiratory status seen in children who receive nebulisation along with postural drainage and percussion. Thus children with respiratory diseases will benefit from the intervention in improving their respiratory status by clearing the secretions.

CHAPTER-I

1.1 INTRODUCTION

"There is only one pretty child in the world, and every mother has it."

- (Chinese Proverb)

Every child is precious for a mother. There are many dreadful diseases which endanger the life of a child. One among those is the respiratory diseases which accounts for high mortality among children less than five years of age.

Lung is a unique organ, inspite of the constant exposure to micro organisms and pollutants, it is kept sterile beyond the first order bronchi. Numerous defence mechanisms including mucociliary escalator mechanism plays a significant role to keep the airway sterile. When its function gets compromised, defective drainage of lung secretions results in insult to the organ. Chest physiotherapy plays an important role by promoting drainage and ensuring normal lung expansion in parenchymal lung diseases and pleural diseases.

Respiratory disease is a medical term that encompasses pathological conditions affecting the oropharynx and trachea, bronchi, bronchioles, alveoli, pleura and pleural cavity, the nerves and muscles of breathing. Respiratory diseases range from mild and self-limiting, such as common cold, to life-threatening entities like bacterial pneumonia, pulmonary embolism, and lung cancer.

Acute respiratory infections are caused by viruses and bacteria; the infection in terms of proportion caused by viruses is much greater. The variety of viruses involved are adenoviruses, influenza viruses, parainfluenza viruses, respiratory syncytial viruses, and rhinoviruses. Acute respiratory infections are more common in young children, with rather specific seasonal occurrences, and some agents are associated with specific respiratory syndromes (Denny FW., 1995)

According to Indian statistics (2007) acute respiratory infections is the leading cause for child mortality (30%) in India. One in every 100 children in India between the age group of 0-14 years suffer from acute respiratory infection.

The disease burden in India is due to the respiratory diseases, namely asthma, bronchitis, tuberculosis and pneumonia. In low source settings these diseases may be attributed to exposure to indoor pollution, solid cooking fuels, poor housing, low nutritional status and poor sanitary conditions. Children less than 5 years of age are found to be at high risk (VR Agnihothram 2004)

In developing countries, about 24% of upper respiratory infections were attributable to environmental risk factors, such as outdoor and indoor air pollution, environmental tobacco smoke. When compared to lower respiratory infections, the rate for upper respiratory infections was estimated to be lower in developed countries, at 12% (5-18%). Globally, more than 1.5 million deaths occur annually from respiratory infections are attributable to the environment. (Bernard and Ben-Simon, 1993)

According to (WHO 2004) says that In India, an estimated that 57,000 deaths were attributed to Asthma in 2004 and it was seen as one of the leading cause of morbidity and mortality in children in rural India.

In 2000-03, six causes accounted for 73% of the 10.6 million yearly deaths in children younger than 5 years of age : pneumonia (19%), diarrhoea (18%), malaria (8%), neonatal pneumonia or sepsis (10%), preterm delivery (10%), and asphyxia at birth (8%). (Bryce J, boschi-pinto (2005) - WHO estimates of causes of death in children

O' Brien KL, Wolfsan LJ (2009) states that in 2010, about 14.5 million episodes of serious pneumococcal disease (uncertainty range 11.1-18.0 million) were estimated to occur. Pneumococcal disease caused about 826,000 deaths in children aged between 1-59 months, Achievement of the UN Millennium Development Goal 4 for child mortality reduction can be

accelerated by prevention and treatment of pneumococcal disease, especially in regions of the world which have them in abundance.

The purpose of aerosol therapy is to prevent or treat conditions of the respiratory tract by adding air- borne water particles and possibly medications, such as mucolytic, decongestant, bronchodilating, and antimicrobial agents. Aerosol therapy may be used in conditions such as pneumonia with atelectasis, asthma, croup, cystic fibrosis and bronchiectasis, It can be used to treat upper respiratory disease. Aerosol therapy can be given immediately before bronchial drainage which increases the effectiveness of the procedure.

The positive effect of nebulised budesonide in addition to the systemic steroids and nebulised salbutamol in improving the spirometric indices in asthmatic children is an encouraging finding for further investigations of its routine use in paediatric emergency department (Y.Nuhoglu, Atas, etal., 2005).

Postural Drainage and Percussion (PD & P), also known as chest physiotherapy, is a widely accepted technique to help people with cystic fibrosis and also to breathe with less difficulty and stay healthy. PD & P uses gravity and percussion to loosen the thick, sticky mucus in the lungs so it can be removed by coughing. Unclogging the airways is critical to reducing the severity of lung infections.

Chest physiotherapy, also referred to as chest percussion, is a technique that involves tapping on the chest and/or back to help loosen thick secretions in order to make them easier to expel, or cough up. It is often used with postural drainage and can be performed using cupped hands or an airway clearance device. Both chest physiotherapy and postural drainage work best after a bronchodilator treatment (Deborah Leader, 2010).

1.2 NEED FOR THE STUDY

According To World Health Organization (2009) every year, almost 11 million children under the age of five in developing countries die from readily preventable and treatable illnesses such as diarrheal dehydration, acute respiratory infections , measles, and malaria. In half of the cases, illness is complicated by malnutrition. By 2010, an attempt was made to reduce the infant and under-five mortality rate by at least one third. And the pursuit of reducing it by two thirds by 2015.

Respiratory infections and other respiratory diseases are the 3rd and 7th highest causes of disease burden in terms of disability adjusted life years accounting for about 15% of total disease burden in India. Compared to other countries, India has among the largest burden of disease due to the use of household fuels. It is estimated that 28% of all deaths happen due to indoor air pollution in developing countries like in India (Jindal, SK and N Singh-2009)

Table:1 Statistics of children with acute respiratory infections admitted at Institute Of Social Paediatrics, Government Stanley Medical College And Hospital, Chennai-1.

Months	Asthma	Pneumonia	Other respiratory diseases(bronchitis, bronchioitis, WALRI etc.,)
January 2011	74	56	32
February	70	55	30
March	67	36	34
April	60	30	33
May	42	29	22
June	47	45	34
July	49	43	32
August	72	39	43
September	70	35	48
October	72	38	47
November	76	39	46
December	74	44	39

Acute respiratory infections (ARI) are a major cause of morbidity and mortality in young children worldwide. They account for nearly 3.9 million deaths every year globally. On an average a child has 5 to 8 attacks of ARI

annually. ARI accounts for 30-40% of the hospital visits by children in office practice (T.K. Parthasarathy).

SIGNIFICANCE OF NEBULISATION IN IMPROVING RESPIRATORY PARAMETERS:

Nebulisers produce a polydisperse aerosol where most of the drug released is of particles of 1 to 5 micron in diameter. They use compressed air or oxygen for atomisation but some use ultrasonic energy. It is very much useful where high doses of drugs can be administered and can be used in ventilated patients and sick children. This type of therapy may be continuous, as and when water is delivered to the airways for the purpose of liquefying the secretions, or intermittent, as and when used to deliver medications.

Nebulised bronchodilators may improve respiratory function in patients with Cystic Fibrosis, which helps in improving airway patency before physiotherapy that may help in the clearance of secretions from the chest. Compound bronchodilator preparations Combivent (ipratropium bromide & salbutamol improves airway patency before physiotherapy and may help in the clearance of secretions from the chest, (Conway & Watson, 1997; Ziebach *Etal,* 2001.,)

A long-term prospective trial was conducted to find the Nebulised hypertonic saline can be used safely and effectively as an adjunct to physiotherapy on improving long-term infection rate, quality of life and lung function (F. Kellett, J. Redfern 2005)

SIGNIFICANCE OF POSTURAL DRAINAGE ON RESPIRATORY STATUS:

Chest physiotherapy (CPT) is a technique used to mobilize or loose secretions in the lungs and respiratory tract. This is especially helpful for patients with large amount of secretions or ineffective cough. Chest physiotherapy consists of external mechanical maneuvers, such as chest percussion, postural drainage, vibration, to augment mobilization and clearance of airway secretions, diaphragmatic breathing with pursed-lips, coughing and controlled coughing.

Postural drainage is a physical therapeutic procedure to prevent the collection of secretions in or remove secretions from the airways and thus reduces stasis, obstruction and secondary infection. The removal of tracheo bronchial secretions is important when there is an increased secretion, increased viscosity of secretions, inadequate removal of secretions, and inadequate cough.

The procedure of bronchial drainage involves percussion, cupping and tapping by the hand of the therapist, parent, nurse, or child on the ribcage over only the segment to be drained. It is useful in acute respiratory conditions, especially after administration of bronchodilators to asthmatic children, during resolution of pneumonia; following removal of foreign body the excessive fluid accumulated in the bronchi has to be removed for complete recovery. During the cupped hand percussion the air column inside the cupped hand causes effective dislodgement of the secretions in the underlying bronchus, because the compression wave is presumably transmitted to the underlying bronchus and aids the gravitational flow of secretions from the bronchus towards the glottis.

The purpose of postural drainage and percussion, is to help patients breathe more freely and to get more oxygen into the body. Chest physiotherapy includes postural drainage, chest percussion, chest vibration, tapping, deep breathing exercises, and coughing. In the early 2000s, some newer devices, such as the positive expiratory pressure valve and the flutter device have been added to the various chest physiotherapy techniques. Chest physiotherapy is normally done in conjunction with other treatments to get rid the airways of secretions. These other treatments include suctioning, nebulizer treatments, and the administering of expectorant drugs (Deanna M. Swartout – Corbeil 2011).

The researcher also found that nebulisation with postural drainage and percussion is an effective nursing intervention to improve the respiratory status. Hence the researcher thought it apt to incorporate both the procedure to find the effectiveness on improving respiratory status among children with respiratory disorders.

1.3 STATEMENT OF THE PROBLEM

A study to assess the effectiveness of nebulisation with postural drainage and percussion on respiratory status among children with selected respiratory disorders at Institute Of Social Paediatrics, Government Stanley Medical College and Hospital, Chennai-1.

1.4 OBJECTIVES

1) To determine the effectiveness of nebulisation with postural drainage and percussion on respiratory status of children in experimental group.

2) To assess the effectiveness of nebulisation on respiratory status of children in control group.

3) To compare the respiratory status of children with respiratory disorders in experimental and control group.

4) To associate the post test level of respiratory status of children with selected demographic variables.

1.5 HYPOTHESIS

H1 – There is a significant difference in the effectiveness of respiratory status among children who received nebulisation with postural drainage and percussion than who received nebulisation alone.

H2 – There is significant association between effectiveness of nebulisation with postural drainage and percussion with selected demographic variables.

1.6 ASSUMPTIONS

1) Respiratory diseases are common in childhood

2) Force of gravity enhances the mobilization of secretions

3) Hydration has the influence on liquefying the secretions

1.7 OPERATIONAL DEFINITION

Effect

It refers to the outcome of the nebulisation with postural drainage and percussion on respiratory status of the children with respiratory disorders which can be measured using a structured tool.

Nebulization

It is the process of administering salbutamol (0.5-1ml) along with normal saline (2.5ml) through inhalation using a nebulizer kit for 10-15 minutes.

Postural Drainage

It is a mere positioning of the child with assistance of gravity to drain the secretion towards the main bronchus. Standardized 10 positions are practiced to drain secretions from all lobe of the lungs. The secretions are drained from upper lobes (apical segment, posterior segment, anterior segment, lingula, middle lobe, lower lobes (anterior basal segment, posterior basal segment, right and left lateral basal segment, superior segment). It is given for 6 minutes (includes 2 minutes percussion) in each position both morning and evening for 2 days.

Percussion

Tapping with the cuffed hand on the chest wall of the children which causes effective dislodgement of secretions from bronchus and bronchioles. It is given for 2 minutes in each position both morning and evening for 2 days.

Respiratory Status

It refers to the physiological status of the respiratory system. Any deviations in the physiological status of the respiratory system results in tachypnea, tachycardia, decreased oxygen saturation, changes in chest movements, work of breathing, chest retraction, nasal flaring, air entry, breath sounds, capillary refill , cough, sputum nature, and use of accessory muscle.

Children

Children under five years are vulnerable for respiratory infections. Children aged between 3-5 years both boys and girls admitted in pediatric ward with selected respiratory disorders.

Respiratory Disorders

It refers to the diseases which affects the respiratory system. Children who are admitted with the diagnosis of the bronchitis, bronchiolitis, bronchopneumonia and asthma were selected for the study.

1.8 DELIMITATION

1) This study is limited to children between 3-5 years and who stay in hospital for a period of 3 days both boys and girls.

2) The study period is limited for 4 weeks.

3) This PD&P technique is performed for children who receive nebulisation with salbutamol alone.

4) This study is limited for children with selected respiratory disorders.

CHAPTER-II
REVIEW OF LITERATURE

Review of literature refers to an extensive and systematic examination of publications relevant to the research project. Review of literature is a key step in research process. Nursing research is considered as a continuing process in which knowledge gained from earlier studies is an integral part of research.

According to ***Polit and Hungler (2007)*** the review of literature is defined as a broad comprehensive in depth systematic and critical review of scholarly publications, unpublished scholarly print materials, audiovisual materials and personal communications. A researcher analyses the existing knowledge before developing into a new area of study while conducting a study, when interpreting the results of the study, and when making judgments about applications of a new knowledge in nursing practice. An extensive review of literature relevant to the research topic was done to gain insight and to collect maximum information for laying the foundation of the study. In this present study, review of literature deals with the following major heading.

PART I: Deals Research and Literature with the following aspects

1) Prevalence of respiratory diseases.

2) Effectiveness of nebulisation.

3) Changes in clinical and bio-physiological parameters.

4) Effectiveness of postural drainage and percussion.

PART II: Conceptual Framework

PART I: 2.1 REVIEW OF LITERATURE

REVIEW RELATED TO PREVALENCE OF RESPIRATORY DISEASES:

Padhi, B. K. and Padhy, P. K. (2008), a clinical article Studied about the domestic fuels, indoor air pollution, and children's health. The study participants about 750 households and 1505 children were selected for this study. The lung function parameters were examined on an electronic Spiro Meter. The study stating that the exposure to cooking smoke from biomass combustion is significantly associated with decline in lung function.

A.V. Ramana kumar and C. Aparajitha (2005), the aim is to review the respiratory disorder burden of rural Indians. Standardised prevalence rates of asthma, bronchitis, pneumonia, tuberculosis are calculated. The results show that poverty and unhealthy environment are strongly related to the respiratory disorders. Among other diseases bronchitis and asthma are recorded to be the leading cause of death in rural India. The author concludes that a great need for improved and effective area- specific health programs and social and economic development are mandatory in rural areas to achieve the desired goals.

Shibi Chakra Varthy K., etal (2002), the aim of the study is to estimate the prevalence of asthma in children less than 12 years of age and the prevalence of asthma in children residing in urban and rural areas of Tamil Nadu. A total of 584 children from Chennai were selected. the overall prevalence of breathing difficulty was 18% and the prevalence of asthma diagnosed was 5%. Twenty two percent of urban and 9% of rural children reported breathing difficulty. Urban children reported recent wheeze more often than rural children. The author concludes that the prevalence of asthma and other 'wheezy' illnesses may be higher in urban areas of Chennai.

Sutapa Agrawal., (2000), approximately 300 million people worldwide currently have Asthma, with estimates suggesting that Asthma prevalence increases globally by 50% every decade. It is estimated that there may be an additional 100 million persons with Asthma by 2025. Most of the

Asian countries including India and China, although reporting relatively lower prevalence rates than those in the West, account for a huge burden in terms of absolute numbers of patients.

Dragana Nikic (1999), this article discuss about the relationship between respiratory symptoms and total air pollution (indoor and outdoor). It is a cohort study random sampling was taken, 653 children aged 1-7 years. It inquired about respiratory symptoms (cough, wheezing, phlegm) and respiratory illness (asthma, bronchitis, pneumonia), indoor air pollution (heating in home and passive smoking). The author suggests that passive smoking may be a significant etiological factor in the occurrence of respiratory symptoms and illness.

Dr.Shally Awasthi, (1997), this article discusses about the seasonal pattern of morbidities in preschool slum children. They selected anganwadi centres under the integrated child development services scheme. A prospective cohort study was done, 32 anganwadi centers were selected from 153 centers by random draw. The result says that there were 1061 children (48.3% girls and 51.7% boys) between the ages of 1.5 to 3.5 years. When compared to other seasons, the incident rate of pneumonia was lowest in the winter months (October to February) Thus the author concludes that the season specific intensification of existing health care resources for these morbidities can be considered.

REVIEW RELATED TO EFFECT OF NEBULISATION

Wg Cdr BM John. Capt D Singh (2010), this article studied the comparison of the nebulised salbutamol with L- epinephrine in first time wheezy children. The sample is Sixty children between two months to 60 months were recruited, 30 in each treatment group. Children received periodic (0, 20, 40 minutes) doses of either salbutamol (0.15mg/kg with 3ml saline) or laevo- epinephrine via nebuliser along with oxygen. Changes in heart rate oxygen saturation , respiratory rate and respiratory distress assessment instrument were assessed. The author concludes that while it can be inferred

that nebulised epinephrine and salbutamol are safe and useful in wheezy children with bronchiolitis/ WALRI.

Anitha Sharma and Arvind Madaan (2007), this Article explains the nebulised salbutamol vs salbutamol and ipratropium combination in asthma. 50 asthmatic children aged 6–14 years were studied. Children were nebulised with three doses of Salbutamol alone and combined nebulisation of Salbutamol and Ipratropium bromide at 20 minutes interval. The results were plotted as a significant improvement in % of PEFR starting at 30 minutes and lasting the entire study period of four hours was noted in both the groups. Thus the researcher concludes that the frequent combined nebulisation with Salbutamol and Ipratropium bromide is beneficial in acute asthma.

Karen sudeep, Sunalene G. Devadason et al (2009); studied the aerosol delivery of nebulised budesonide in young children with asthma. The subjects taken for the study were ten asthmatic children (5 males), mean age 20.3 months (range 6–41 months) inhaled radio labelled budesonide (MMD 2.6 μm) through a modified vibrating membrane nebuliser The author concludes that by using an improved age-adjusted complementary combination of delivery device and drug formulation to deliver small particles, lung deposition and ratio of lung deposition to oro pharyngeal deposition in young asthmatic children is highly improved.

Y. Nuhoglu, Atas, et al., (2005) studied the acute effects of additional bronchodilator response to systemic steroids plus nebulised salbutamol in the early management of children with acute asthma. Asthmatic patients aged between 5-15 years in a double-blind, placebo-controlled were investigated; they received three consecutive doses of nebulised salbutamol and one dose of parenteral methyl prednisolone. Pulmonary index scoring and peak flow meter was performed in both groups before and after the treatment. The results showed that there was a statistically significant difference between the two groups with respect to the increase in PEFR ($p=0.0155$). The author concludes that the effect of nebulised budesonide in addition to systemic steroids and nebulised salbutamol in improving the spirometric indices in asthmatic children.

Craven D, Kercsmar CM, et al (2001), the aim of the study is to determine whether the addition of repeated doses of nebulised ipratropium bromide (IB) to a standardized inpatient asthma care algorithm (ACA) for children with status asthmatics improve clinical outcome of the children. Children with acute asthma (N = 210) aged 1 to 18 years were assigned in randomized double-blind fashion. Both groups received nebulised albuterol, systemic corticosteroids, and oxygen. Assessments of oxygenation, air exchange, wheezing, accessory muscle use, and respiratory rate were performed. The results shows that Children >6 years (N = 70) treated with IB had shorter mean hospital length of stay (P=.03). Thus the author concludes use of nebulized IB to a systemic corticosteroids confers no significant enhancement of clinical outcome for the treatment of hospitalized children with status asthmaticus.

Besbes- ouanes L, Nouira S et al.,(2000), this article explains the study conducted to compare the clinical and spirometric effects of continuous and intermittent nebulisation of salbutamol in acute severe asthma. The participants were 42 consecutive patients were prospectively randomly assigned to receive 27.5 mg of salbutamol. All participants received oxygen and intravenous hydrocortisone. The results observed is of significant clinical and spirometric improvement which was observed in both groups. The author concludes that they did not observe an appreciable difference between continuous and intermittent nebulisation of salbutamol in acute severe asthma.

C o' Callaghan, Milner et al., (1998), this clinical article studies the effect of nebulised salbutamol on airways of children under one year old. The participants for the study were ten infants under the age of one year each of whom gave a history of recurrent wheezing attacks. All 10 showed a significant deterioration in lung function when given nebulised water for two minutes with an increase in airways resistance. The investigator concludes that the airways were protected against the broncho constricting effect of nebulised water by the adrenoreceptor stimulant salbutamol.

REVIEW RELATED TO CHANGE IN BIO-PHYSIOLOGICAL PARAMETERS AFTER NEBULISATION WITH POSTURAL DRAINAGE AND PERCUSSION:

Joseph V. Doboson, MD., et al, (1998), this article cites the use of albuteral in hospitalised infants with bronchiolitis. This prospective, randomized clinical trial was performed. The participants for study were a total of 52 patients less than 24 months of age with a diagnosis of moderately severe, acute viral bronchiolitis were enrolled and assigned to receive nebulised albuterol. SaO_2, accessory muscle use, and wheezing were recorded and the actual length of hospital stay was also measured. The results shows that both groups showed significant improvement in oxygen saturation over time.

Rietveld S, kolk AM, Prins PJ et al (1997) , this article explains the influence of the respiratory sounds on breathlessness in children with asthma. children aged 7-17 years, asthmatic wheezing sounds were recorded in 16 children during histamine-induced airway obstruction. After standardized physical exercise, 45 asthmatic and 45 non asthmatic children were randomly assigned to (a) false feedback of wheezing, (b) quiet respiratory sounds, or (c) no sound. Asthmatic children reported significantly more breathlessness in the 1st versus the 3rd condition. In conclusion, many asthmatic children were easily influenced by wheezing in their estimation of asthma severity, reflected in breathlessness.

Dr. D. J. Turner, L. I. Landau, et al., (1993), the aim of this study was to seek such a relationship in young asthmatic children using dose-response curves. The study samples were fourteen asthmatic subjects aged 3–9 years with a forced expiratory volume. Each subject given 5 doses of salbutamol (albuterol) at 15 min intervals. Forced vital capacity, and forced expiratory flow were measured before and after each nebulisation. The results show that all lung function parameters, Sa_{O2} and HR increased significantly. Thus the investigator suggests that the level of response to a bronchodilator increases significantly with increasing age in young asthmatics.

Poelaert J, Lannoy B, Vogelaers et al., (1991), this article shows the influence of chest physiotherapy on arterial oxygen saturation, two groups of ventilated patients were compared for chest physical therapy on an ICU: respiratory insufficient patients on one side and a control population on the other were submitted either to percussion or vibration therapy, and to postural drainage. The lateral position results in a better SaO2 in the pneumonia group while SaO2 tend to decrease in the control population. Our data suggested that CPT does not result in a short term respiratory benefit.

Pryor JA, Webber BA, (1990)., this article explains the effect of chest physiotherapy on oxygen saturation in patients with cystic fibrosis. When these features were included in an active cycle of breathing techniques during postural drainage in 20 patients with cystic fibrosis there was no fall in arterial oxygen saturation during the procedure (mean values 87.1%, 87.9%, and 86.7% before, during, and after treatment).

REVIEW RELATED TO EFFECT OF POSTURAL DRAINAGE AND PERCUSSION

Michael R Bye, MD (2011), the author states that bronchiectasis is characterized by the dilatation of bronchi with destruction of elastic and muscular components of their walls. Chest physiotherapy and postural drainage are important elements in the treatment of bronchiectasis and should be taught to the child's parents early in the course of disease. This is especially true when the child produces significant amounts of sputum. Physiotherapy techniques should be frequently reviewed and retaught.

Cpaludo, L Zhang, Etal.,(2008), this research article discuss about Chest physiotherapy as an adjunct to the treatment of children hospitalised with acute pneumonia A randomised controlled trial children aged 29 days to 12 years were hospitalised with pneumonia. Out of them 51 were randomly allocated to the intervention group (chest physiotherapy plus standard treatment for pneumonia) and 47 to the control group (standard treatment for pneumonia alone). The primary outcome was time to clinical resolution. The secondary outcomes were the length of stay in hospital and duration of

respiratory symptoms and signs. Chest physiotherapy as an adjunct to standard treatment that does not hasten clinical resolution of child.

De Boeck k, Vermeulen F, et al (2008), this research article discusses about the airway clearance techniques to treat acute respiratory disorders in children. Airway clearance techniques are an important part of the respiratory management in children with cystic fibrosis, bronchiectasis and neuromuscular disease. To speed up the recovery these techniques are frequently prescribed for previously healthy children with acute respiratory disorder.

Atonigbinde, Raadedoyin et al., (2007), the primary aim of this study was to determine the effect of postural drainage positions and percussion in prone lying with foot end of bed raised to 45cm and right side lying with 45 degree turn on to the face on cardiovascular and cardio respiratory parameters such as systolic blood pressure, diastolic blood pressure, heart rate and respiratory rate. The participants were forty subjects (20 males and females) participated in the study. The cardiovascular and cardio respiratory parameters were measured at sitting, pre, mid and post positioning after 15 minutes. The results showed that percussion significantly decreased the systolic blood pressure, while the respiratory rate was increased significantly when the subjects were in prone lying position.

Mcllwaine. M. (2007), this article study the effect of Chest physical therapy, breathing techniques and exercise in children with Cystic Fibrosis. Chest physiotherapy in the form of airway clearance techniques and exercise has played an important role in the treatment of cystic fibrosis. Recently, the technique of PD&P has been modified to include only non-dependant head-down positioning due to the detrimental effects of placing a person in a Trendelenburg position. Rather, when exercise is used in addition to postural drainage and percussion there is an enhanced secretion removal and an overall benefit to the patient.

Perotta C, Ortiz, Z Roque I Figuls et al., (2007), this article focussed on the role of chest physiotherapy in children younger than 2 years

with acute bronchiolitis. A Randomised control trial was used in which the children were evaluated with vibration and percussion technique with postural drainage positions compared to no intervention. The outcome measured is the improvement in the clinical score and in the length of the hospital stay, duration of oxygen supplementation, and the use of bronchodilators and steroids. The author concludes thatchest physiotherapy using vibration and percussion techniques does not reduce length of hospital stay, oxygen requirements, or improve the severity of clinical score in infants with acute bronchiolitis.

Dennis Mccool, MD, Fccp (2006), this research article discusses the effectiveness of non pharmacological airway clearance therapies. The results says that Chest physiotherapy , including postural drainage, chest wall percussion and vibration, and forced expiration technique (called *huffing*), increase airway clearance as assessed by sputum characteristics (*ie*, volume, weight, and viscosity) Thus the author concludes that some non pharmacological therapies are effective in sputum production.

Varekojis SM, Douce FH, Flucke RL et al., (2003), the aim of the study is to compare the effectiveness of and patient preferences regarding 3 airway clearance methods: postural drainage and percussion (PD&P), intrapulmonary percussive ventilation, and high-frequency chest wall compression.(HFCWC) The participants were hospitalized CF patients $\geq$12 years old. Twenty-four were studied. In random order, each patient received two consecutive days of each therapy, delivered three times daily for 30 minutes. Sputum was collected during and 15 minutes after each treatment, weighed wet, then dried and weighed again. The results were that the mean wet sputum weights differed significantly ($p = 0.035$). The author concludes that professionally administered PD&P for hospitalized CF patients, and the 3 modalities were equally acceptable to them.

Rujipat Samransamruajkit, et al., (2003), the aim of the study is to determine the possible beneficial effects of chest physiotherapy in hospitalised asthmatic children. Prospective randomised controlled study was taken. Forty five children aged 6-16years were studied. children were

randomized to receive the Flutter treatment in addition to the standard therapy. Spirometry and an asthma clinical score were measured every day. The results showed that there was a significant increase in FVC and FEV_1 by those who received Flutter treatment on the first and second hospital day ($p < 0.05$) compared with those who received the standard treatment.

Zaklad Usprawniania Leczniczego, et al, (2000), this research article evaluates the efficiency of thoracic physiotherapy methods used in the treatment of patients with cystic fibrosis. They studied 21 patients, aged 5-18years and compared five chest physiotherapy techniques. The following indices were measured: weight of coughed sputum, oxygen saturation before, during and after drainage, peak expiratory flow (PEF) before and after drainage. Our findings demonstrate that the Flutter with relaxation effectively facilitates removal of mucus from airways. The author concludes that PEF decrease ($p > 0.05$) during postural drainage with tapping and vibration.

Colin Wallis, Ammani Prasad (1999), this clinical article studies about the need of physiotherapy. The author says that the central function of chest physiotherapy in paediatric respiratory disease is to assist in the removal of trachea bronchial secretions. The intention is to remove airway obstruction, reduce airway resistance, enhance gas exchange, and reduce the work of breathing. Chest physiotherapy can improve a patient's respiratory status and expedite recovery.

Miller S, Hall DO, Clayton CB et al (1995), the aim of this study is autogenic drainage was compared with the active cycle of breathing techniques (ACBT) together with postural drainage. The participants for study were eighteen patients with cystic fibrosis, a randomized two-day crossover trial was done. Airway clearance, expectorated sputum, pulmonary functions tests, oxygen saturation and heart rate were measured. The results found are autogenic drainage cleared mucus from the lungs faster than ACBT over the whole day. Thus the author concludes that the autogenic drainage was found to be as good as ACBT at clearing mucus in patients with cystic fibrosis and is therefore an effective method of home physiotherapy.

M.Innes Asher,mb, et al., (1990), this clinical article studied the effect of chest physiotherapy on lung function in children recovering from acute severe asthma. children aged 6-13 years, totally 38 children were selected in a randomised controlled placebo trail. Among 38, 19 received chest physiotherapy and 19 received placebo visits. Each child had four treatments over two days, which was preceded by salbutamol nebulisation. Lung volumes and flow rates was recorded by a body plethysmograph before salbutamol nebulisation and postural drainage. The asthma drug therapy was given throughout the study. The results were the three 12 year old children in Physiotherapy group showed improvement in lung function.

TM Kaminska MCSP, (1988), this article discusses the study comparing the effects of postural drainage and the administration of positive expiratory pressure as techniques of physiotherapy management of patients with chronic bronchial sepsis. The data is collected in the form of comparison of an open study on 12 patients over a period of six weeks. Measurements have been made of sputum production during physiotherapy, total time spent on physiotherapy, mean daily peak expiratory flow rates derived from morning and evening measurements. The author concludes that a minority of patients benefit from the positive expiratory pressure technique.

Phillip P. Sutton (1988), this article states that the Chest physiotherapy should now be updated with attention to three important features: first, its use should be limited to those patients with actual or potential sputum production and its central aim should be to increase expectoration. Second, it should incorporate the forced expiration technique with postural drainage and omit traditional elements such as percussion and vibration. Third, the additional use of inhaled adrenergic agents and possibly oral high frequency oscillation may increase sputum clearance further.

PART II: 2.2 CONCEPTUAL FRAMEWORK

Conceptual framework (theoretical frameworks) are a type of intermediate theory that attempt to connect to all aspects of inquiry (e.g., problem definition, purpose, literature review, methodology, data collection and analysis).

Conceptual frameworks can act like maps that give coherence to empirical inquiry. Because conceptual frameworks is potentially so close to empirical inquiry, they take different forms depending upon the research question or problem.

The conceptual framework of the study was based on Widenbach's helping art of clinical nursing theory model as a tool for assessing health care quality.

Widenbach's defines the central purpose as to what the nurse wants to accomplish.

Prescription refers to the plan of care for a patient, it specifies the nature of the action that will fulfill the nurses central purpose and the rationale for that action.

Realities refer to the physical, psychological, emotional and spiritual factors that come into play in a situation involving nurses action.

MODIFIED WIDENBACH'S HELPING ART OF CLINICAL NURSING THEORY MODEL

The modified Widenbach's helping art of clinical nursing theory model contains the following factors:

Identification indicates the purpose component, in which the investigator implemented the various assessing factors like demographic variables, health variables, respiratory status assessment includes clinical assessment and bio-physiological measurements.

Ministration is the prescription part in which the investigator implemented the intervention part of the experimental and control group. In this present study, postural drainage and percussion with nebulisation was given to experimental group for selected respiratory disorders and for control group, nebulisation alone was given.

Validation is the realities part in which the investigator evaluated the effectiveness of the study that was identified.

CONCEPTUAL FRAME WORK

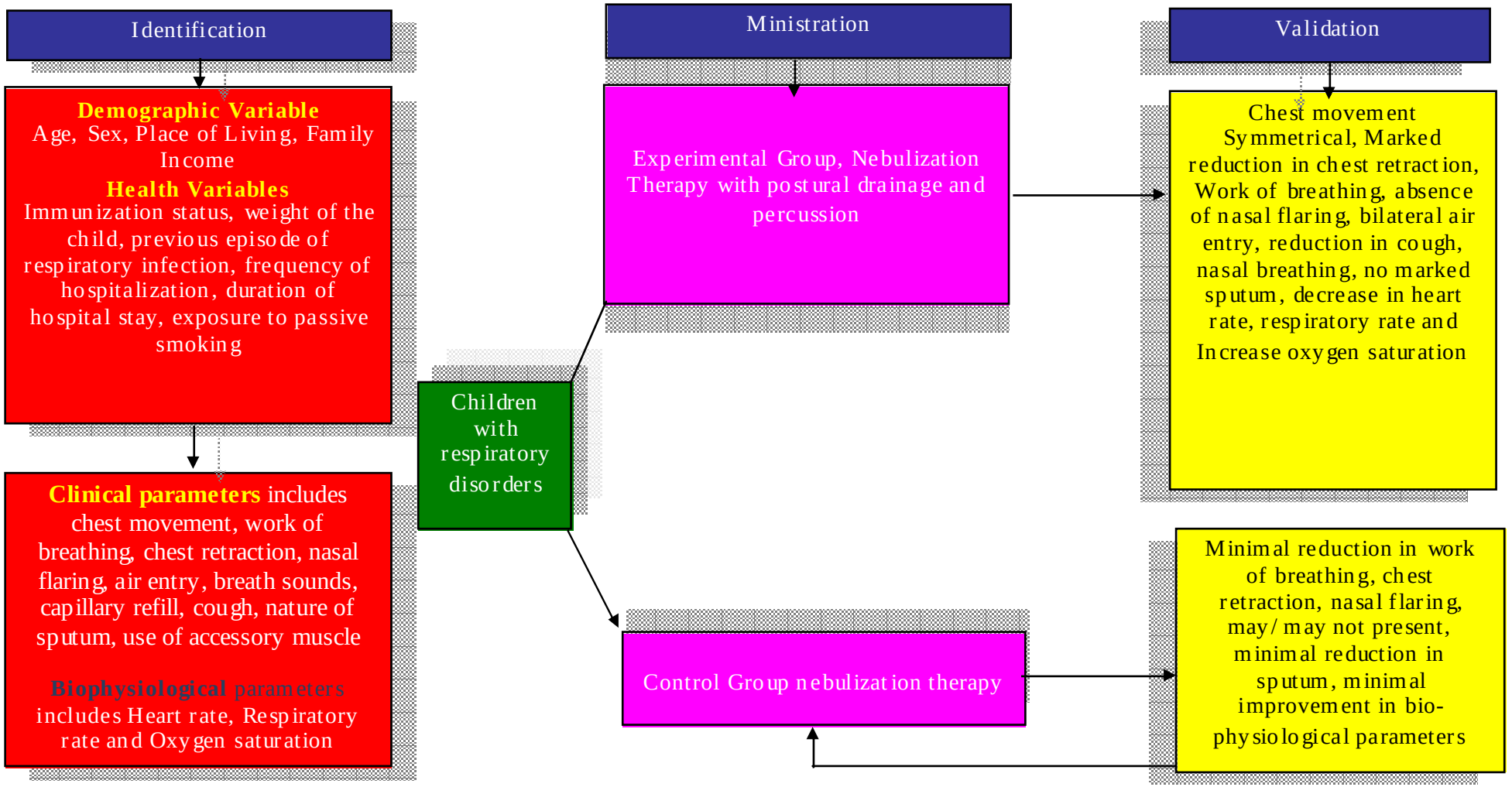


FIG-1: MODIFIED WIDENBACH'S HELPING ART OF CLINICAL NURSING THEORY (1964)

CHAPTER-III
3.1 METHODOLOGY

Methodology is the most important part of research study, which enables the researcher to form a blueprint of the research undertaken. Research methodology involves the systematic procedure by which the researcher starts from the time of initial identification of the problem to its final conclusion.

This chapter deals with the brief description of the different steps undertaken by the investigator for the study. It includes the research approach, research design, and variables, setting of the study, population, sample and sampling techniques, development of tool, description of tool, data collection procedure and plan for data analysis.

3.2 RESEARCH APPROACH AND DESIGN

The research approach selected was done by using quantitative approach and the research design was Quasi Experimental Study Design which studies the observable changes that takes place in order to establish a cause & effect relationship. The aim of this quasi experimental research is to assess the effectiveness of nebulisation with postural drainage and percussion among children with selected respiratory disorders.

TABLE-2: RESEARCH DESIGN

Experimental group	O1	X1	O2
Control group	O3	X2	O4

O1 - Before Intervention Experimental group

X1 - Nebulisation with postural drainage and percussion

O2 - After Nebulisation with postural drainage and percussion

O3 - Before Nebulisation Control group

X2 - Nebulisation

O4 - After Nebulisation

3.3 VARIABLES

The study variable is an improvement in respiratory status (Dependent variable) and nebulisation with postural drainage and percussion (Independent variable) the demographic variables are age, sex, immunization status, weight, previous episode of respiratory infection, frequency of hospitalization, duration of hospital stay during illness, exposure to passive smoking, place of living, family income per month.

3.4 SETTING OF THE STUDY

The study was conducted in a selected pediatric medical ward at Institute Of Social Paediatrics, Government Stanley Medical College and Hospital, Chennai-1. Out of this approximately 8-10 children were admitted with respiratory disorders for every 2-3 days. Average length of stay of a patient is a week. The institute has been rendering meritorious service & also has been providing an avenue for research in the field of child health.

3.5 STUDY POPULATION

The study population were, children with selected respiratory disorders admitted in pediatric medical ward within the age group of 3-5years both boys and girls receiving nebulisation with salbutamol in Institute of social paediatrics, Government stanley medical college and hospital, Chennai-1.

3.6 SAMPLE

The samples for study were the Children admitted in selected pediatric medical wards within the age group of 3-5years receiving nebulisation with salbutamol and who fulfill the inclusion criteria.

3.7 SAMPLE SIZE

The sample size was N=60

Experimental group N=30

Control group N=30

3.8 SAMPLING TECHNIQUE

The sampling technique used was convenient sampling technique. Every day 2 children were taken for study. First 30 children were assigned for nebulisation with postural drainage and percussion therapy (experimental group) and next 30 children were given nebulisation therapy (control group) who fulfill the inclusion criteria

According to ***Polit and Hungler (2009),*** Convenient sampling technique entails using the most conveniently available people as participants for the study.

3.9 CRITERIA FOR SAMPLE SELECTION

Inclusion Criteria

1) Children aged between 3 to 5years both boys and girls admitted in selected pediatric medical wards.

2) Children who are admitted with respiratory disorders like Bronchitis, Bronchiolitis, Bronchopneumonia and Asthma.

3) Children who are prescribed for nebulisation therapy with salbutamol 0.5ml-1ml with normal saline 2.5ml.

4) Children who are hospitalised for 3 days

5) Children and parents who were willing to participate in the study

Exclusion Criteria

1) Children who were critically ill and with ventilator support.

2) Children who were prescribed for nebulisation therapy other than salbutamol.

3) Children with respiratory diseases associated with other disease condition such as cardiac disease.

4) Mothers of children who were not willing to participate in the study.

3.10 DEVELOPMENT OF THE TOOL

The investigator developed the data collection tool after extensive review of literature and discussion with experts, to collect the data needed for the study.

SECTION - A: Includes Demographic variables

SECTION - B: Respiratory Status Assessment

1. Clinical parameters (Rating Scale)

2. Bio Physiological Measurements

3.11 DESCRIPTION OF THE TOOL

SECTION-A

Demographic data consisting of age, sex, immunization status, weight, previous episode of infection, frequency of hospitalization for respiratory illness, duration of hospital stay during illness, exposure to passive smoking, place of living, family income per month.

Weight: Children were recorded by using platform weighing scale; the child was weighed at a correct level for the child's weight was recorded to the precision of 0.5 kg. The expected weight is calculated by using formula:

AGE IN YEARS X 2 + 8.

SECTION-B

Respiratory Status Assessment

1) Clinical parameters which includes chest movements, work of breathing, chest retraction, nasal flaring, air entry, breath sounds, capillary refill test, cough, sputum nature and use of accessory muscle. It is done by inspection, auscultation and suctioning.

2) Bio Physiological Measurement includes heart rate, respiratory rate and oxygen saturation by palpation, inspection and by using pulse oximeter.

3.12 ETHICAL CONSIDERATION

This study was conducted after the approval from the ethical committee, Madras Medical College, Chennai-3. All respondents were carefully informed about the purpose of the study and their part during the study and how the privacy was guarded and ensured confidentiality of the result. Thus the investigator followed the ethical guidelines, which were issued by research committee or by authority. Written permission were obtained from the parents of all participants.

3.13 TESTING OF TOOL

Content validity

The content of the tool was validated by experts in the field of medicine and nursing. The suggestion of the experts was incorporated in the study and the tool was finalized. The refined tool was used for data collection and content validity was obtained. After the modifications they agreed that this tool for assessing efficiency of nebulisation with postural drainage and percussion on respiratory status of children.

Reliability

After pilot study reliability of the tool was assessed by using Test retest method. Efficacy questionnaire reliability was assessed using test retest method and its correlation coefficient value is 0.81. This correlation coefficient is very high and it is good tool for assessing efficiency of nebulisation with postural drainage and percussion on respiratory status of children. .

3.14 PILOT STUDY

The pilot study was conducted after getting formal administrative permission and ethical clearance. The pilot study was conducted in the selected pediatric medical wards at Government Stanley Medical College and Hospital, Chennai, for the period of one week from 21.03.2011 to 27.03.2011. Formal permission was obtained from the Director, Institute of Social Pediatrics, Government Stanley Medical College and Hospital, Chennai-1.

Eight samples (four for experimental group, four for control group) that fulfilled the inclusion criteria were chosen from the main population by using convenient sampling technique. Informed written consent was obtained from the mothers of the children and data was collected for two consecutive days. The instrument was found reliable for proceeding with the main study. The suggestion made were to increase the sample size from fifty to sixty. The intervention is carried out for two times a day for two days instead of once a day for three days. The other opinion and suggestion were incorporated in the main study to accomplish the objectives of the study.

3.15 DATA COLLECTION PROCEDURE

Permission was obtained from the Director, Institute of social paediatrics, Government Stanley Medical College and Hospital, Chennai-1. The period of study was from 29.08.2011 to 29.09.2011.

After obtaining formal permission, brief introduction was given to the mother of children regarding the study and written consent was obtained from them. Children those who fulfilled the inclusion criteria were chosen for the study and divided in to two groups.

PART-I

Assessing the demographic variables.

PART 2

Assessing the respiratory status of the children, Samples were selected based on convenient sampling technique and first 30 samples (experimental group) were assigned for nebulisation with postural drainage and percussion and next 30 samples (control group) were given nebulisation therapy. For the experimental group intervention were given for 11/2 hours twice a day (morning and evening) for two days and for control group nebulisation therapy were given for 30 minutes twice a day (morning and evening) for two days. (Includes assessment and recording time).

On the day of admission pre assessment was done on respiratory status which includes clinical parameters and bio physiological measurements and the scores were recorded for both group continuously for two days (morning and evening) before and after intervention. The post assessment was done on respiratory status on day two after last intervention.

INTERVENTION

For experimental group- salbutamol nebulisation 0.5 - 1ml added with 2.5 ml of normal saline administered via nebulizer followed by postural drainage and percussion for 11/2 hours, six minutes (includes 2 minutes percussion) in each position both morning and evening for two days. Standardised 10 positions are practiced to drain secretions from all lobes of the lungs. The secretions are drained from upper lobes (apical segment, posterior segment, anterior segment, lingula, middle lobe, lower lobes (anterior basal segment, posterior basal segment, right and left lateral basal segment, superior segment).

For control group- salbutamol nebulisation 0.5 - 1ml added with 2.5 ml of normal saline administered via nebulizer for 15minutes twice a day (morning and evening) for 2days not followed by postural drainage and percussion.

SCORING TECHNIQUE:

RESPIRATORY STATUS ASSESSMENT:

CLINICAL PARAMETERS:

Score

0 – Normal

1- 7 – Mild distress (35%)

8 – 14 – Moderate distress (36-70%)

15-20 – Severe distress (71-100%)

BIO-PHYSIOLOGICAL PARAMETERS (BPM)

Heart rate

90-110 beats/minute	-	0 (Normal)
Above 110 – 124 beats/minute	-	1 (Tachycardia)
Above 124 beats/minute	-	2 (Severe tachycardia)

Respiratory rate

24-30 breaths / minute	-	0 (Normal)
Above 30- 44 breaths /minute	-	1 (Tachypnea)
Above 44 breaths /minute	-	2 (Severe tachypnea)

Oxygen Saturation (SaO2)

91 – 100%	-	0 (Normal SaO2)
85 – 90 %	-	1 (Low SaO2)
Less than 85%	-	2 (Very low SaO2)

Score:

0	–	Normal BPM
1-3	–	Mild/ Moderately altered BPM
4- 6	–	Severely altered BPM

3.16 DATA ANALYSIS AND INTERPRETATION

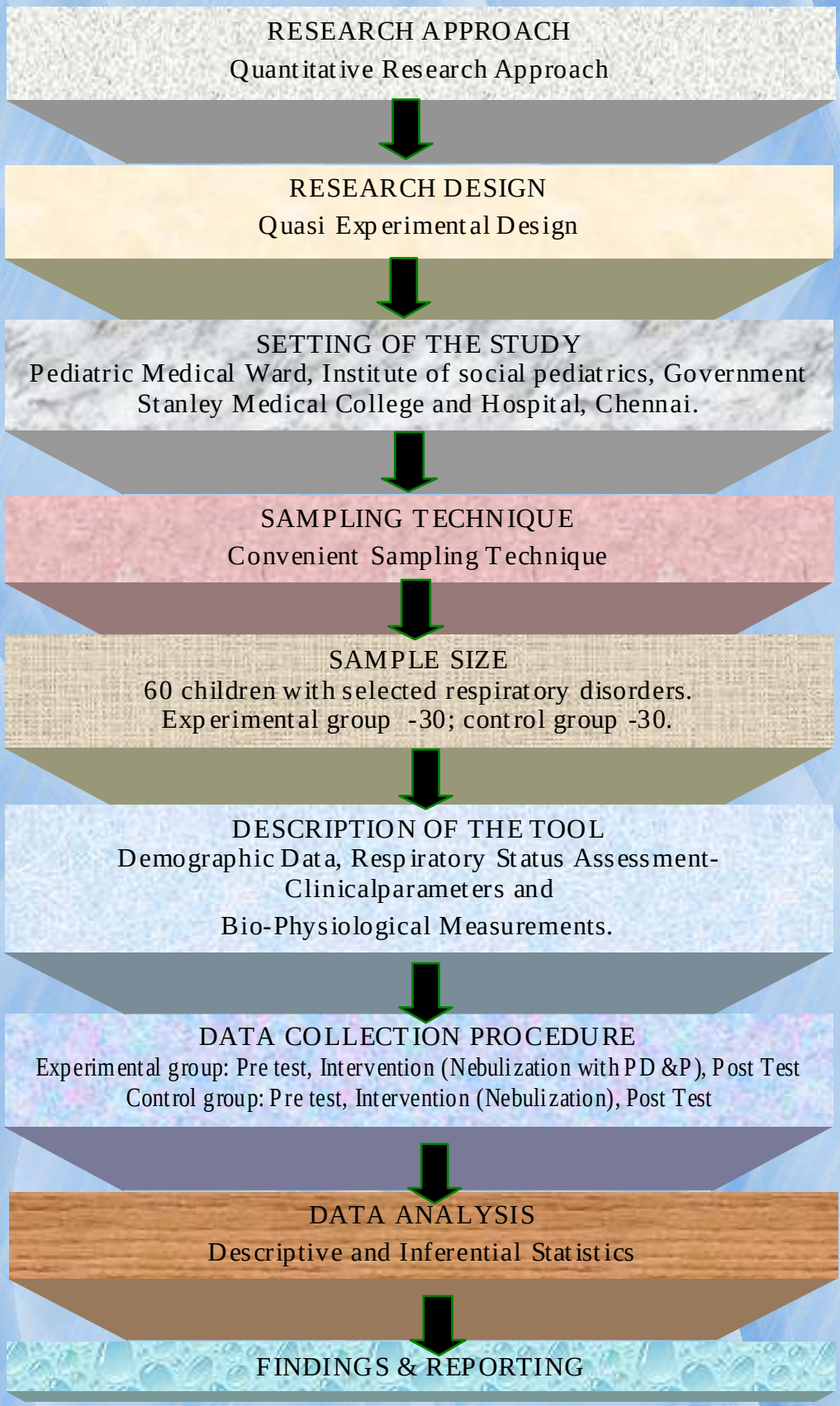
- Demographic variables in categories were given in frequencies with their percentages.
- Respiratory status assessment and bio physiological measurements were given in mean and standard deviation and student t-test.

- Association between demographic variables and Respiratory status assessment and bio physiological measurements were analysed using Pearson chi-square test.

- Simple bar diagram, Multiple bar diagram, Pie diagram were used to represent the data.

- $P<0.001$ was considered statistically significant. All statistical tests were two tailed test.

FIG-2 SCHEMATIC REPRESENTATION OF THE PLAN



CHAPTER-IV
4.0 DATA ANALYSIS AND INTERPRETATION

This chapter deals with the analysis and interpretation of the data collected.

Analysis is a method for rendering quantitative, meaningful and providing intellectual information. So that the research problem can be studied and tested including the relationship between the variables.

The data collected has been analyzed using appropriate statistical methods and the results that are described below.

ORGANIZATION OF THE DATA

SECTION I : Distribution of demographic variables.

SECTION II : Assessment of the effectiveness of nebulisation with postural drainage and percussion on respiratory status of children in experimental group

SECTION III : Assessment of the effectiveness of nebulisation on respiratory status of children in control group

SECTION IV : Compare the respiratory status of children with respiratory disorders in experimental and control group

SECTION V : Associate the post test level of respiratory status of children with selected demographic variables.

SECTION -I

TABLE 3: DEMOGRAPHIC PROFILE

Demographic variables		Group			
		Experiment (N=30)		Control (N=30)	
		n	%	N	%
Age	3.0 - 3.5 yrs	12	40.0%	10	33.3%
	3.6 - 4.0 yrs	5	16.7%	7	23.3%
	4.1 - 4.5 yrs	5	16.7%	7	23.3%
	4.6 - 5.0 yrs	8	26.7%	6	20.0%
Sex	Male	20	66.7%	17	56.7%
	Female	10	33.3%	13	43.3%
Immunization status	Up to date	26	86.7%	22	73.3%
	Post dated	1	3.3%	4	13.3%
	Delayed due to illness	3	10.0%	4	13.3%
Weight of the child	Below normal	24	80.0%	24	80.0%
	Normal	6	20.0%	6	20.0%
Previous episode of RI	First episode	3	10.0%	2	6.7%
	2 -3 episode	16	53.3%	15	50.0%
	4 -5 episode	7	23.3%	9	30.0%
	> 5 episode	4	13.3%	4	13.3%
Frequency of hospitalization	First time	12	40.0%	12	40.0%
	2 -3 times	12	40.0%	14	46.7%
	4 -5 times	2	6.7%	1	3.3%
	> 5 times	4	13.3%	3	10.0%

Demographic variables		Group			
		Experiment (N=30)		Control (N=30)	
		n	%	N	%
Duration of Hospital stay	< 3 days	11	36.7%	16	53.3%
	3 - 5 days	14	46.7%	9	30.0%
	6 - 7 days	2	6.7%	5	16.7%
	>7 days	3	10.0%	0	0.0%
Exposure to passive smoking at home	Exposed	10	33.3%	7	23.3%
	Not exposed	20	66.7%	23	76.7%
Place of living	Rural	0	0.0%	3	10.0%
	Semi urban	10	33.3%	9	30.0%
	Urban	20	66.7%	18	60.0%
Family income	< Rs.5000	1	3.3%	0	0.0%
	Rs.5000 -7000	26	86.7%	24	80.0%
	> Rs.7000	3	10.0%	6	20.0%

The above table –3 shows that less than half of the proportion the age of the child in experimental group (40%) and in control group (33.3%) belongs to the age between 3 - 3.5years.

The sex of the child (66.7%) in experimental group and (56.7%) in control group were male children and less than half of the proportion (33.3%) in experimental group and (43.3%) in control group were female child.

Immunization status of the children of which majority (86.7%) in the experimental group and (73.3%) in control group received up to date immunization.

The weight of the children was found to be of equal proportion (80%).

History of previous episodes of infection was in equal proportion (53.3%) in experimental group and (50%) in control group had 2-3 episodes of infection.

Frequency of hospitalization was of (40%) in both experimental group and control group who visited hospital for the first time and majority (40%) in experimental group and (46.7%) in control group visited for 2-3 times for the same illness.

The duration of hospital stay for the majority was (53.3%) in control group and (36.7%) in experimental group who stayed for less than 3 days in hospital and majority (46.7%) in experimental group and (30.0%) in control group stayed for 3-5 days.

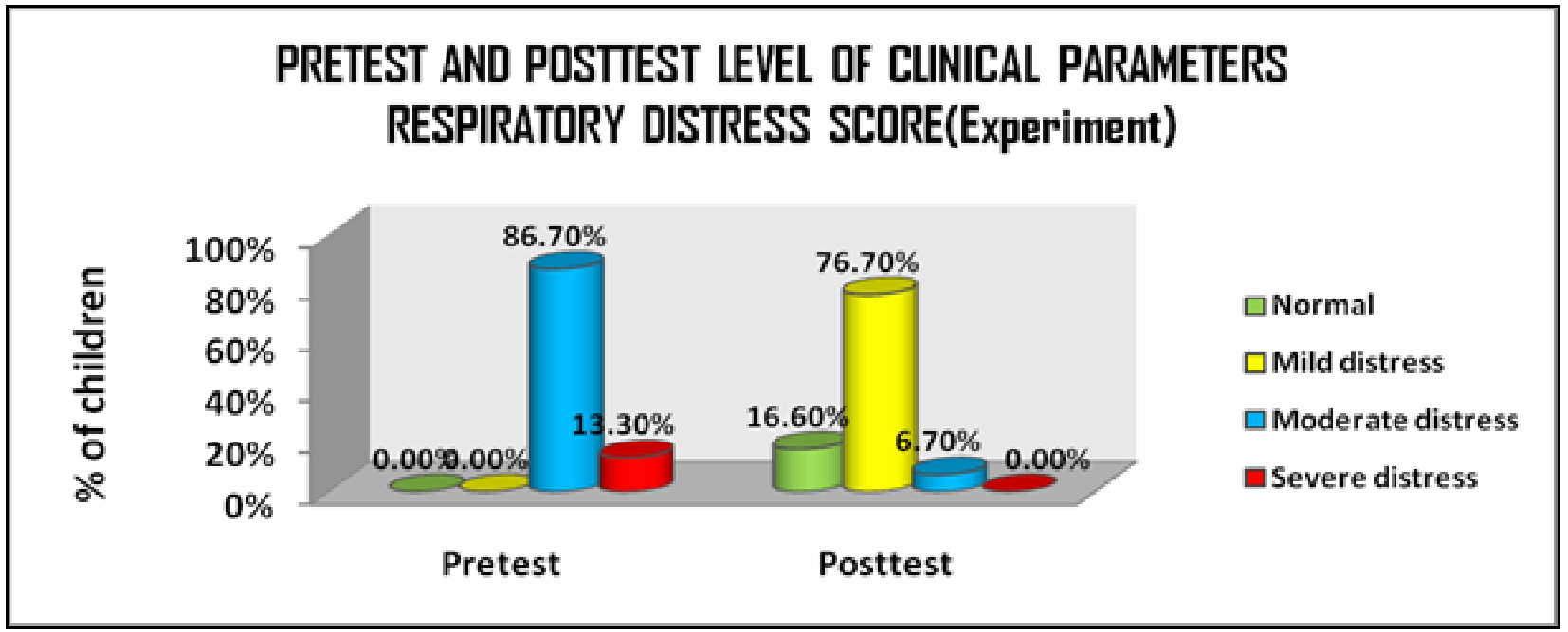
Concerned with the exposure of passive smoking at home the majority (66.7%) in experimental Group and (76.7%) in control group were not exposed to passive smoking.

The place of living for the majority (66.7%) in experimental group and (60.0%) in control group lived in urban area.

The family income (86.7%) in experimental group and (80.0%) in control group earned Rs. 5000-7000.

SECTION-II: TO DETERMINE THE EFFECT OF NEBULISATION WITH POSTURAL DRAINAGE AND PERCUSSION ON RESPIRATORY STATUS OF CHILDREN IN EXPERIMENTAL GROUP.

Fig-3: Pretest and posttest level of clinical parameters respiratory distress score (Experiment)



The above fiqure -3 shows that pre and pos test level of clinical parameters respiratory distress score in experimental group. In pretest children with moderate distress is 86.7% and severe distress is 13.3% and post test is 76.7% children moved to moderate distress and none had severe distress.

Table-4: COMPARISON OF PRE- AND POSTTEST CLINICAL PARAMETERS SCORE AMONG EXPERIMENTAL GROUP CHILDREN

	No. of children	**Pretest Mean±SD**	**Posttest Mean±SD**	**Student's paired t-test**
Clinical parameter score	30	11.33±2.32	4.17±2.48	t=24.88 P=0.001*** DF =29

* Significant at P≤0.05** highly significant at P≤0.01*** very high significant at P≤0.001

Table no 4 shows the comparison of respiratory status clinical parameter score before and after the administration of nebulisation with postural drainage and percussion.

On an average, a decrease is seen in children with respiratory disorder with regard to the clinical parameter distress score from 11.33 to 4.17 after the administration of nebulisation with postural drainage and percussion. Due to nebulisation with postural drainage and percussion they are able to reduce 7.16 score from base line score. This reduction is statistically significant. Statistical significance was calculated by using student's paired 't' test. Thus it is evident that nebulisation with postural drainage and percussion is more effective in children with respiratory disorders in improving clinical parameter score.

Table-5: COMPARISON OF PRETEST AND POSTTEST BIOPHYSIOLOGICAL PARAMETER SCORE AMONG EXPERIMENTAL GROUP CHILDREN

LEVEL OF BIO-PHYSIOLOGICAL PARAMETERS		PRETEST SCORE		POSTTEST SCORE		PEARSON CHI SQUARE TEST
		N	%	N	%	
Experimental group	Normal	0	0.0%	13	43.3%	$\chi 2 = 13.14$ P = (0.001***) DF = 2
	Mild/ moderate	12	40.0%	17	56.7%	
	Severe	18	60.0%	0	0.0%	

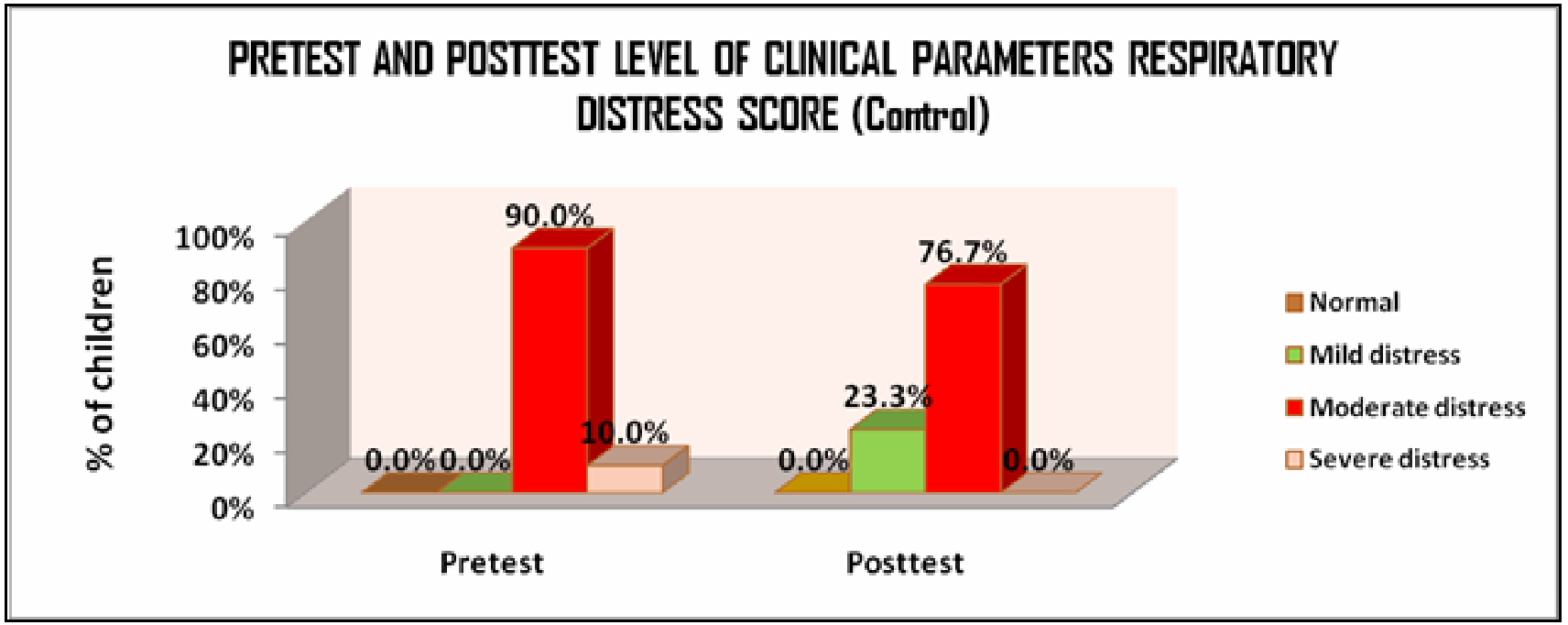
Table no 5, shows the comparison of respiratory status bio physiological parameter score before and after the administration of nebulisation with postural drainage and percussion using pearson chisquare test.

On an average, children with respiratory disorder are reduced their bio physiological parameter score . In pretest none of the children had shown normal bio physiological parameter score, 12 (40.0%) showed mild to moderate and 18 (60.0%0) showed severe .

In post test 13(43.3%) of children moved to normal, 17(56.7%) of children moved to mild/moderate from severely altered bio physiological parameters. This reduction is statistically significant (P=0.001***). Statistical significance was calculated by using chi square test. Thus it is evident that nebulisation with postural drainage and percussion is more effective in improving bio physiological parameter score

SECTION III: TO ASSESS THE EFFECT OF NEBULISATION ON RESPIRATORY STATUS OF CHILDREN IN CONTROL GROUP

Fig-4: Pretest and post test level of clinical parameters respiratory distress score (Control)



The above figure 4 showed that the pretest score was (90%) of moderate distress and (10%) of severe distress in control group and the post test score only (76.7%) moved to moderate distress and none of the children had severe distress.

TABLE-6: COMPARISON OF PRE - AND POSTTEST CLINICAL PARAMETERS SCORE AMONG CONTROL GROUP CHILDREN

	No. of children	Pretest Mean±SD	Posttest Mean±SD	Student's paired t-test
Clinical parameter score	30	11.17±1.89	7.90±1.32	t=6.65 P=0.001*** DF =29

*significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001***

Table no 6 shows the comparison of respiratory status clinical parameter score before and after the administration of nebulisation.

On an average, children with respiratory disorder showed a decline in their clinical parameter score from 11.33 to 7.90 after the administration of nebulisation. Due to nebulisation they were able to reduce 3.27 score from base line score. This reduction was statistically significant. Statistical significance was calculated by using student's paired't' test. Thus it is evident that children with respiratory disorders shows less improvement in their clinical parameter score after administration of nebulisation.

TABLE-7: COMPARISON OF PRE AND POSTTEST BIO PHYSIOLOGICAL PARAMETER SCORE AMONG CONTROL GROUP CHILDREN.

LEVEL OF BIO-PHYSIOLOGICAL PARAMETERS		PRETEST SCORE		POSTTEST SCORE		PEARSON CHI SQUARE TEST
		N	%	N	%	
Control group	Normal	1	3.3%	0	0.0%	$\chi 2 = 9.85$ P = 0.001 DF = 2
	Mild/ moderate	14	46.7%	25	46.7%	
	Severe	16	53.3%	5	53.3%	

Table no 7 shows the comparison of respiratory status bio physiological parameter score before and after the administration of nebulisation alone to children in control group.

On an average, respiratory disorder children are slowly reduced their bio physiological parameter score . In pretest one child 1 (3.3%) had shown normal bio physiological parameter score, 14 (46.7%) showed mild to moderate and 16(53.3%) showed severe alteration in bio physical parameter.

In post test none of the children moved to normal, 25 (46.7%) of children moved to mild/moderate and 5 (53.3%) of children stayed in severely altered bio physiological parameters. This reduction is also statistically significant. Statistical significance was calculated by using chisquare test. Thus it is evident that nebulisation alone is less effective in children with respiratory disorders and improves bio physiological parameter score slowly.

SECTION IV: TO COMPARE THE RESPIRATORY STATUS OF CHILDREN WITH RESPIRATORY DISORDERS IN EXPERIMENTAL AND CONTROL GROUP

TABLE-8: COMPARISON OF POSTTEST CLINICAL PARAMETERS

Clinical parameters		Group				Pearson Chi square test
		Experiment		Control		
		N	%	N	%	
Chest movements	Symmetrical	23	76.7%	13	43.3%	$\chi2=7.30$ P=0.02* DF=2
	Less symmetrical	7	23.3%	16	53.3%	
	Unequal	0	0.0%	1	3.3%	
Work of breathing	Normal	6	20.0%	0	0.0%	$\chi2=26.26$ P=0.001*** DF=2
	Difficulty	21	70.0%	8	26.7%	
	Noisy	3	10.0%	22	73.3%	
Chest retraction	No retraction	15	50.0%	4	13.3%	$\chi2=18.40$ P=0.001*** DF=2
	Intermittent	15	50.0%	14	46.7%	
	Continuous	0	0.0%	12	40.0%	
Nasal flaring	Absent	30	100.0%	25	83.3%	$\chi2=5.45$ P=0.02* DF=1
	Intermittent	0	0.0%	5	16.7%	
Air entry	Bilateral	30	100.0%	30	100.0%	$\chi2=0.00$ P=1.00 DF=1
	Unilateral	0	0.0%	0	0.0%	
Breath sounds	Normal	5	16.7%	0	0.0%	$\chi2=20.84$ P=0.001*** DF=2
	Wheeze	20	66.7%	8	26.7%	
	Severe wheeze	5	16.7%	22	73.3%	

Clinical parameters		Group				Pearson Chi square test
		Experiment		Control		
		N	%	N	%	
Cough	No cough	5	16.7%	0	0.0%	$\chi 2=16.36$ P=0.001*** DF=2
	Intermittent	21	70.0%	12	40.0%	
	Persistent	4	13.3%	18	60.0%	
Capillary refill	< 2 seconds	30	100.0%	30	100.0%	$\chi 2=0.00$ P=1.00 DF=1
	> 3 seconds	0	0.0%	0	0.0%	
Sputum nature	No sputum	23	76.7%	10	33.3%	$\chi 2=17.18$ P=0.001*** DF=2
	Thin mucoid	7	23.3%	8	26.7%	
	Thick purulent	0	0.0%	12	40.0%	
Use of accessory muscle	Nasal breathing	22	73.3%	3	10.0%	$\chi 2=29.63$ P=0.001*** DF=2
	Mouth breathing	8	26.7%	13	43.3%	
	Strenuous muscle breathing	0	0.0%	14	46.7%	

*Significant at $P\leq0.05$ ** Highly significant at $P\leq0.01$ *** Very high significant at $P\leq0.001$

Table 8 ,shows that in post test, considering clinical parameters, there was a statistically significant difference between experiment and control group except air entry and capillary refill. Air entry is bilateral and capillary refill is less than 2 seconds in both groups. There was a significant difference between experiment and control group in the level of distress score. This was calculated using pearson chi square test.

TABLE-9: COMPARISON OF HEARTRATE

	Heart rate (Beats per minute)			Group				Pearson chi square test
				Experiment		Control		
				N	%	N	%	
DAY1	MORNING	Pretest	90 -110	4	13.3%	2	6.7%	$\chi2$=0.74 P=0.69 DF=2
			110 -124	14	46.7%	15	50.0%	
			>124	12	40.0%	13	43.3%	
		Posttest	90 -110	4	13.3%	2	6.7%	$\chi2$=0.74 P=0.69 DF=2
			110 -124	14	46.7%	15	50.0%	
			>124	12	40.0%	13	43.3%	
DAY1	EVENING	Pretest	90 -110	5	16.7%	2	6.7%	$\chi2$=1.46 P=0.48 DF=2
			110 -124	13	43.3%	15	50.0%	
			>124	12	40.0%	13	43.3%	
		Posttest	90 -110	13	43.3%	2	6.7%	$\chi2$=11.26 P=0.004** DF=2
			110 -124	11	36.7%	15	50.0%	
			>124	6	20.0%	13	43.3%	
DAY2	MORNING	Pretest	90 -110	13	43.3%	3	10.0%	$\chi2$=10.39P=0.006*** DF=2
			110 -124	13	43.3%	15	50.0%	
			>124	4	13.3%	12	40.0%	
		Posttest	90 -110	24	80.0%	9	30.0%	$\chi2$=17.01 P=0.001*** DF=2
			110 -124	6	20.0%	14	46.7%	
			>124			7	23.3%	
DAY2	EVENING	Pretest	90 -110	24	80.0%	9	30.0%	$\chi2$=16.66 P=0.001*** DF=2
			110 -124	6	20.0%	15	50.0%	
			>124			6	20.0%	
		Posttest	90 -110	30	100.0%	10	33.3%	$\chi2$=30.00 P=0.001*** DF=2
			110 -124			17	56.7%	
			>124			3	10.0%	

Table 9, compares Heart rate between experiment and control group children. It shows there was no difference between experiment and control group children till first day evening pretest, after second day morning post test it shows a significant difference between experiment and control group children heart rate.

On day1 pretest among 30 in experimental group only 4 children had normal heart rate, 14 had tachycardia and12 had severe tachycardia. In control group only 2 children had normal heart rate, 15 had tachycardia and 13 had severe tachycardia.

After giving intervention twice a day for two days, on day 2 evening post test score, all 30 children in experimental group moved to normal heart rate and in control group only10 children moved to normal heart rate, 17 were still had tachycardia and 3 were still had severe tachycardia. This proves that children with respiratory disorders move from tachycardia to normal heart rate in experimental group and in control group many had high heart rate. Thus it is evident that after giving nebulisation with postural drainage and percussion children showed an improvement in their heart rate.

TABLE-10: COMPARISON OF RESPIRATORY RATE

	Respiratory rate (Breaths/per minute)			Group				Pearson chi square test
				Experiment		Control		
				N	%	N	%	
DAY1	MORNING	Pretest	24 -30	0	0.0%	0	0.0%	χ^2=0.16 P=0.68 DF=1
			30 -44	4	13.3%	3	10.0%	
			>44	26	86.7%	27	90.0%	
		Posttest	24 -30	0	0.0%	0	0.0%	χ^2=0.16 P=0.68 DF=1
			30 -44	4	13.3%	3	10.0%	
			>44	26	86.7%	27	90.0%	
DAY1	EVENING	Pretest	24 -30	0	0.0%	0	0.0%	χ^2=0.16 P=0.68 DF=1
			30 -44	4	13.3%	3	10.0%	
			>44	26	86.7%	27	90.0%	
		Posttest	24 -30	0	0.0%	0	0.0%	χ^2=0.16 P=0.68 DF=1
			30 -44	4	13.3%	3	10.0%	
			>44	26	86.7%	27	90.0%	
DAY2	MORNING	Pretest	24 -30	0	0.0%	0	0.0%	χ^2=3.35 P=0.07 DF=1
			30 -44	10	33.3%	4	13.3%	
			>44	20	66.7%	26	86.7%	
		Posttest	24 -30	3	10.0%	0	0.0%	χ^2=12.29 P=0.002** DF=2
			30 -44	17	56.7%	7	23.3%	
			>44	10	33.3%	23	76.7%	

	Respiratory rate (Breaths/per minute)			Group				Pearson chi square test
				Experiment		Control		
				N	%	N	%	
DAY2	EVENING	Pretest	24 -30	4	13.3%	0	0.0%	$\chi 2$=11.17P=0.003*** DF=2
			30 -44	16	53.3%	8	26.7%	
			>44	10	33.3%	22	73.3%	
		Posttest	24 -30	13	43.3%	0	0.0%	$\chi 2$=27.38 P=0.001*** DF=2
			30 -44	15	50.0%	11	36.7%	
			>44	2	6.7%	19	63.3%	

Table 10, compares Respiratory rate between experiment and control group children. It shows that there was no difference between experiment and control group children till second day morning pretest, after that it showed that there was a significant difference between experiment and control group children respiratory rate.

On day1 pretest among 30 in the experimental group none of the children had normal respiratory rate , 4 had tachypnea and 26 had severe tachypnea. In control group none of the children had normal respiratory rate, 3 had tachypnea and 27 had severe tachypnea.

After giving intervention twice a day for two days, on day 2 evening post test score, in experimental group 13 children moved to normal , 15 children had tachypnea and only 2 children had severe tachypnea and in control group none moved to normal respiratory rate, 11 were still had tachypnea and 19 were still had severe tachypnea. This proves that children with respiratory disorders moves from tachypnea to eupnea gradually in experimental group and very slowly in control group. Thus it is evident that nebulisation with postural drainage and percussion is effective in reducing the respiratory rate.

TABLE-11: OXYGEN SATURATION

	Oxygen saturation			Group				Pearson chi square test
				Experiment		Control		
				N	%	N	%	
DAY 1	MORNING	Pretest	91% - 100%	14	46.7%	16	53.3%	$\chi 2$=1.16 P=0.58 DF=2
			85% - 90%	15	50.0%	14	46.7%	
			< 85%	1	3.3%	0	0.0%	
		Posttest	91% - 100%	17	56.7%	16	53.3%	$\chi 2$=1.18 P=0.55 DF=2
			85% - 90%	12	40.0%	14	46.7%	
			< 85%	1	3.3%	0	0.0%	
DAY 1	EVENING	Pretest	91% - 100%	17	56.7%	16	53.3%	$\chi 2$=1.18 P=0.55 DF=2
			85% - 90%	12	40.0%	14	46.7%	
			< 85%	1	3.3%	0	0.0%	
		Posttest	91% - 100%	14	46.7%	16	53.3%	$\chi 2$=1.17 P=0.54 DF=2
			85% - 90%	15	50.0%	14	46.7%	
			< 85%	1	3.3%	0	0.0%	
DAY 2	MORNING	Pretest	91% - 100%	25	83.3%	19	63.3%	$\chi 2$=3.08 P=0.07 DF=1
			85% - 90%	5	16.7%	11	36.7%	
			< 85%	0	0.0%	0	0.0%	
		Posttest	91% - 100%	30	100.0%	27	90.0%	$\chi 2$=3.18 P=0.08 DF=1
			85% - 90%	0	0.0%	3	10.0%	
			< 85%	0	0.0%	0	0.0%	

	Oxygen saturation			Group				Pearson chi square test
				Experiment		Control		
				N	%	N	%	
DAY 2	EVENING	Pretest	91% - 100%	30	100.0%	28	93.3%	$\chi 2=1.40$ P=0.24 DF=1
			85% - 90%	0	0.0%	2	6.7%	
			< 85%	0	0.0%	0	0.0%	
		Posttest	91% - 100%	30	100.0%	28	93.3%	$\chi 2=1.40$ P=0.24 DF=1
			85% - 90%	0	0.0%	2	6.7%	
			< 85%	0	0.0%	0	0.0%	

Table 11, compares oxygen saturation between experiment and control group children. It was checked by using pulse oximeter. It shows that there was no difference between experiment and control group children.

On day1 pretest among 30 in experimental group one child had normal oxygen saturation, 14 had moderately low oxygen saturation and 15 had severely low oxygen saturation. In control group 16 children had normal oxygen saturation, 14 had moderately low oxygen saturation.

After giving intervention twice a day for two days, on day 2 evening post test score, in experimental group all 30 children moved to normal , and in control group 28 children moved to normal, only 2 children stayed with moderately low oxygen saturation. This proves that children with respiratory disorders shows no significant difference in post test score. Thus it is evident that children in both experimental and control group shows good improvement in oxygen saturation after intervention.

TABLE-12: COMPARISON OF BIO-PHYSIOLOGICAL PARAMETERS AMONG EXPERIMENTAL AND CONTROL GROUP

Level of Bio-physiological parameters		Group				Pearson Chi square test
		Experiment		Control		
		N	%	n	%	
Pretest	Normal	0	0.0%	1	3.3%	$\chi 2=0.27$ P=0.60 DF=1
	Mild/ Moderate	12	40.0%	14	46.7%	
	Severe	18	60.0%	16	53.3%	
Posttest	Normal	13	43.3%	0	0.0%	$\chi 2=19.52$ P=0.001*** DF=2
	Mild/ Moderate	17	56.7%	25	83.4%	
	Severe	0	0.0%	5	16.6%	

Table 12, compares level of Bio-physical parameters between experiment and control group children. It shows, in pretest there was no difference between experiment and control group children. In post test they are having statistically significant difference. Level of score was significant for the difference between experiment and control group was calculated using pearson chi square test.

SECTION-V: TO ASSOCIATE THE POST TEST LEVEL OF RESPIRATORY STATUS OF CHILDREN WITH SELECTED DEMOGRAPHIC VARIABLES

Table-13: ASSOCIATION BETWEEN POSTTEST LEVEL OF CLINICAL PARAMETER SCORE AND DEMOGRAPHIC VARIABLES (Experimental group)

Demographic variables		Level of Clinical parameters				Total	Pearson chi square test
		Normal		Mild /moderate distress			
		N	%	N	%		
Age	3 - 4 yrs	0	0.0%	17	100.0%	17	$\chi 2=5.32$ P=0.01** DF=1
	4 - 5 yrs	5	38.5%	8	61.5%	13	
Sex	Male	4	20.0%	16	80.0%	20	$\chi 2=0.48$ P=0.49 DF=1
	Female	1	10.0%	9	90.0%	10	
Immunisation Status	Upto date	5	19.2%	21	80.8%	26	$\chi 2=0.92$ P=0.33 DF=1
	Not upto date	0	0.0%	4	100.0%	4	
Weight of the child	Below normal	2	8.3%	22	91.7%	24	$\chi 2=6.0$ P=0.01** DF=1
	Normal	3	50.0%	3	50.0%	6	
Previous episode of RI	First episode	0	0.0%	3	100.0%	3	$\chi 2=0.66$ P=0.41 DF=1
	> 1 episode	5	18.5%	22	81.5%	27	
Frequency of Hospitalization	First time	2	16.7%	10	83.3%	12	$\chi 2=0.00$ P=1.00 DF=1
	> 1time	3	16.7%	15	83.3%	18	

Demographic variables		Level of Clinical parameters				Total	Pearson chi square test
		Normal		Mild /moderate distress			
		N	%	N	%		
Duration of Hospital stay	< 3 days	4	36.3%	7	63.7%	11	χ^2=4.85 P=0.03* DF=1
	> 3 days	1	5.3%	18	94.7%	19	
Exposure of passive smoking at home	Exposed	1	10.0%	9	90.0%	10	χ^2=0.48 P=0.49 DF=1
	Not exposed	4	20.0%	16	80.0%	20	
Place of living	Rural/semi urban	2	20.0%	8	80.0%	10	χ^2=0.12 P=0.79 DF=1
	Urban	3	15.0%	17	85.0%	20	
Family income	< Rs.7000	4	14.8%	23	85.2%	27	χ^2=0.67 P=0.41DF=1
	> Rs.7000	1	33.3%	2	66.7%	3	

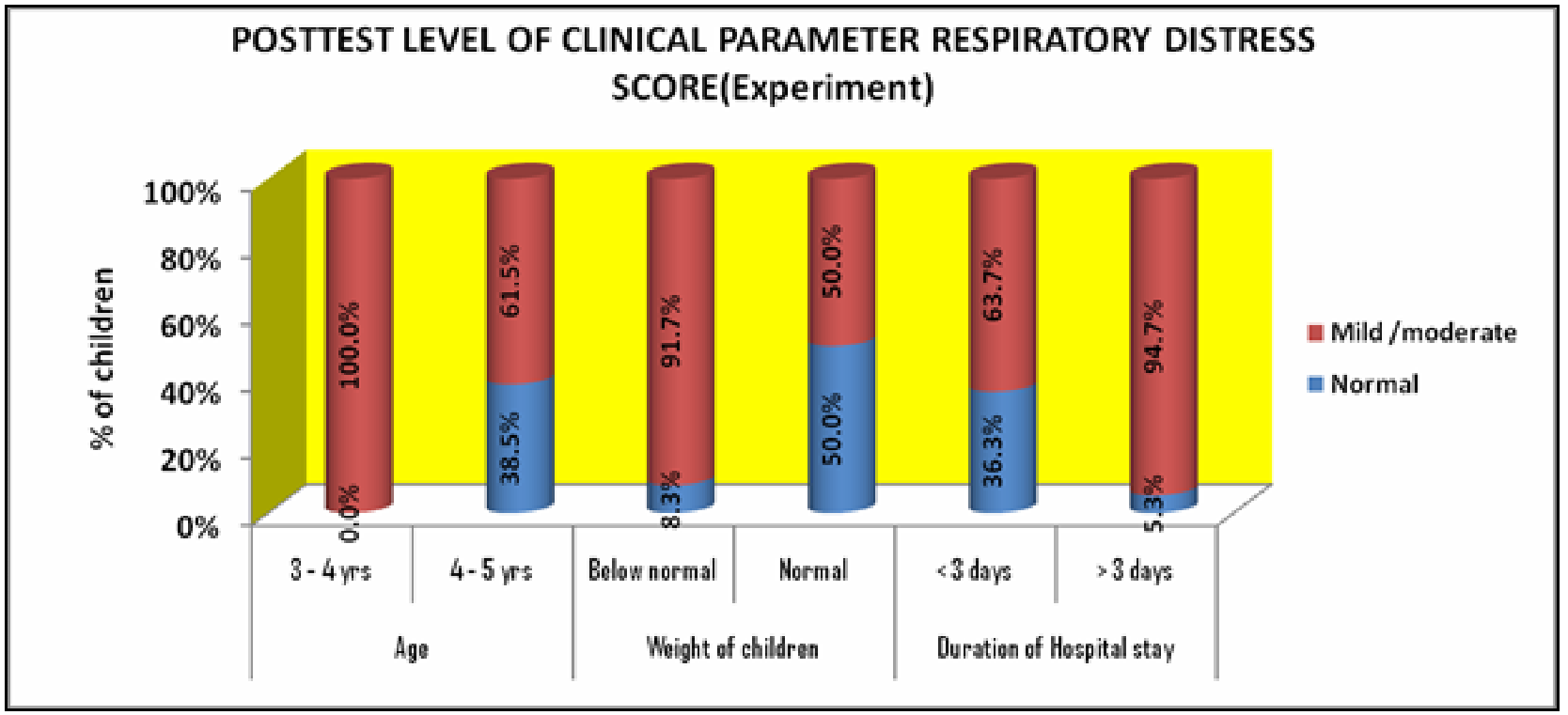
*significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

Table no 13, shows the association between demographic variables and their level of post test distress score. The age of the child, weight of child and duration of hospital stay are significantly associated with their post test level distress score.

Elder chidren, normal weight children and children had less duration of hospital stay during illness children are having more normal clinical parameter sore than others.

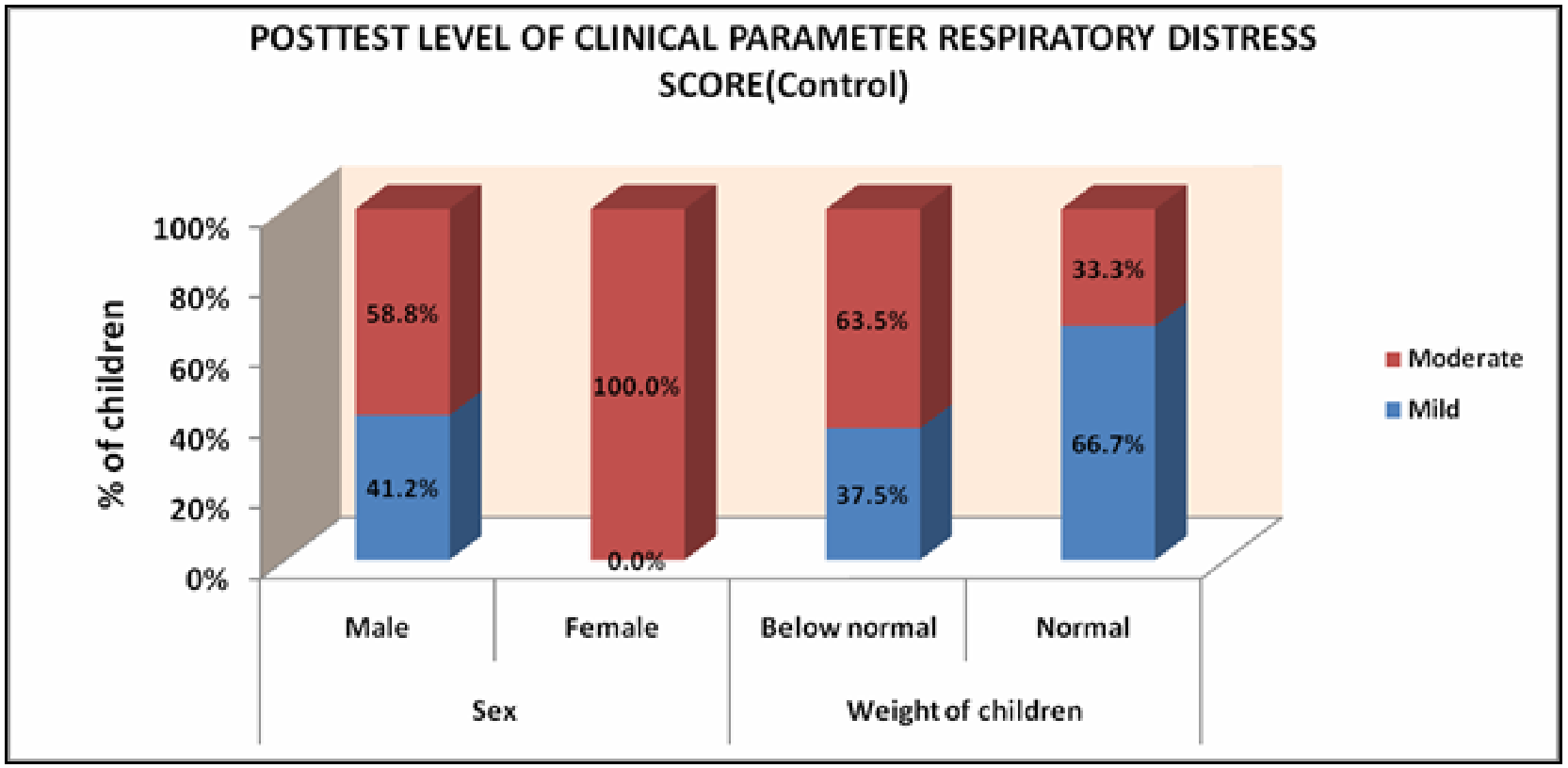
Statistical significance was analyzed using Pearson chisquare test/ Yates corrected chisquare test.

Fig-5 : Post test level of clinical parameter respiratory distress score (Experiment)



The above fiqure-5 shows the association between demographic variables and their level of post test distress score. Elder chidren, normal weight children and less duration of hospital stay during illness children moved to more normal clinical parameter score than others.

Fig-6: Post test level of clinical parameter respiratory distress score (Control)



The above figure -6 shows the association of sex and weight of the child with post test level of clinical parameters respiratory distress score in control group. Male children and normal weight children were having more mild distress than others

Table-14: ASSOCIATION BETWEEN POSTTEST LEVEL OF BIO-PHYSIOLOGICAL PARAMETERS SCORE AND DEMOGRAPHIC VARIABLES (Experimental group)

Demographic variables		Level of Bio-physiological parameters				Total	Pearson chi square test
		Normal		Mild /moderate distress			
		n	%	N	%		
Age	3 - 4 yrs	7	41.2%	10	58.8%	17	$\chi 2=0.07$ P=0.78 DF=1
	4 - 5 yrs	6	46.2%	7	53.8%	13	
Sex	Male	9	45.0%	11	55.0%	20	$\chi 2=0.07$ P=0.79 DF=1
	Female	4	40.0%	6	60.0%	10	
Immunisation Status	Upto date	13	50.0%	13	50.0%	26	$\chi 2=3.52$ P=0.06 DF=1
	Not upto date	0	0.0%	4	100.0%	4	
Weight of the child	Below normal	8	33.3%	16	66.7%	24	$\chi 2=4.89$ P=0.03* DF=1
	Normal	5	83.3%	1	16.7%	6	
Previous episode of RI	First episode	1	33.3%	2	66.7%	3	$\chi 2=0.14$ P=0.71 DF=1
	> 1 episode	12	44.4%	15	55.6%	27	
Frequency of Hospitalization	First time	4	33.3%	8	66.7%	12	$\chi 2=0.81$ P=0.36 DF=1
	> 1time	9	50.0%	9	50.0%	18	
Duration of Hospital stay	< 3 days	4	36.4%	7	63.6%	11	$\chi 2=0.34$ P=0.54 DF=1
	> 3 days	9	47.4%	10	52.6%	19	
Exposure of passive smoking at home	Exposed	1	10.0%	9	90.0%	10	$\chi 2=4.90$ P=0.02* DF=1
	Not exposed	12	60.0%	8	40.0%	20	

Demographic variables		Level of Bio-physiological parameters				Total	Pearson chi square test
		Normal		Mild /moderate distress			
		n	%	N	%		
Place of living	Rural/semi urban	7	70.0%	3	30.0%	10	χ^2=4.34 P=0.04* DF=1
	Urban	6	30.0%	14	70.0%	20	
Family income	< Rs.7000	11	40.7%	16	59.3%	27	χ^2=0.73 P=0.39DF=1
	> Rs.7000	2	66.7%	1	33.3%	3	

*significant at P≤0.05 ** highly significant at P≤0.01 *** very high significant at P≤0.001

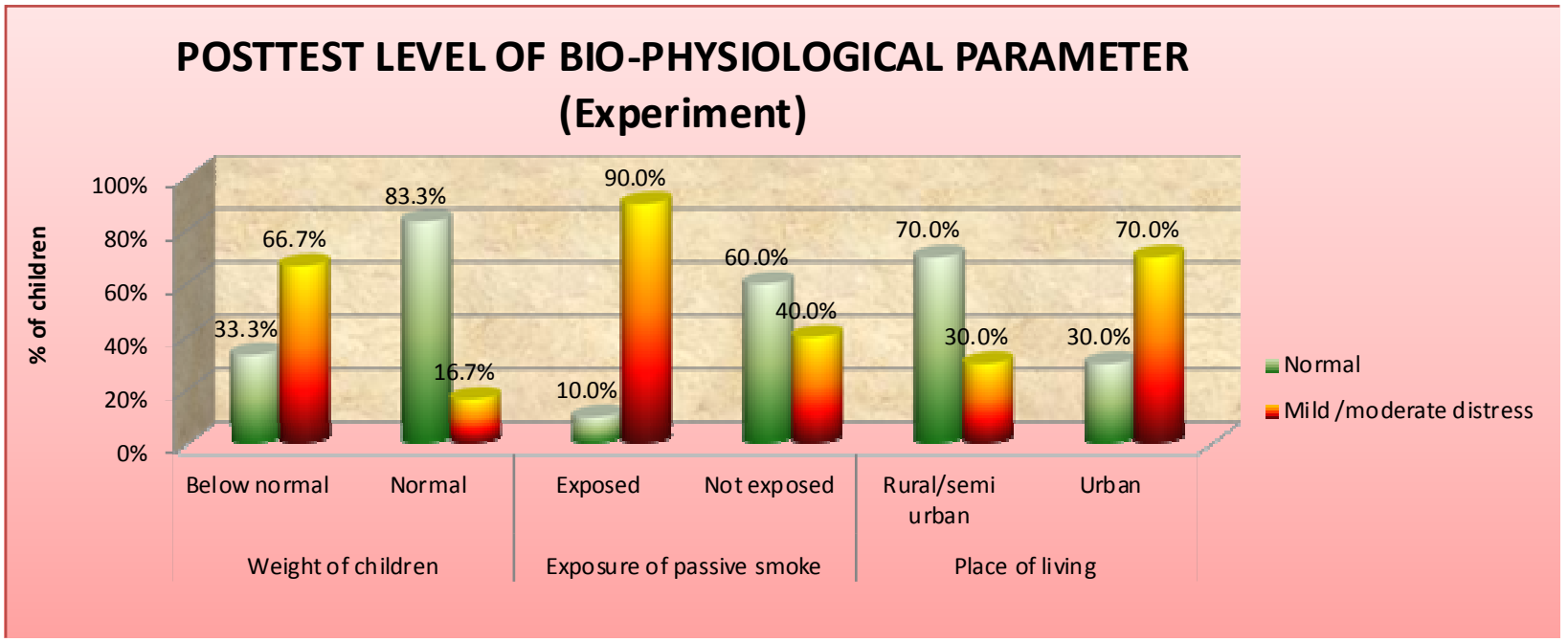
Table no 14 shows the association between demographic variables and their level of posttest bio-physiological factors score.

The weight of the child, exposure to passive smoking and place of living are significantly associated with their posttest level bio-physiological factors score.

The children with normal weight children and not exposed to passive smoking, rural children were having more normal bio physiological parameters than others

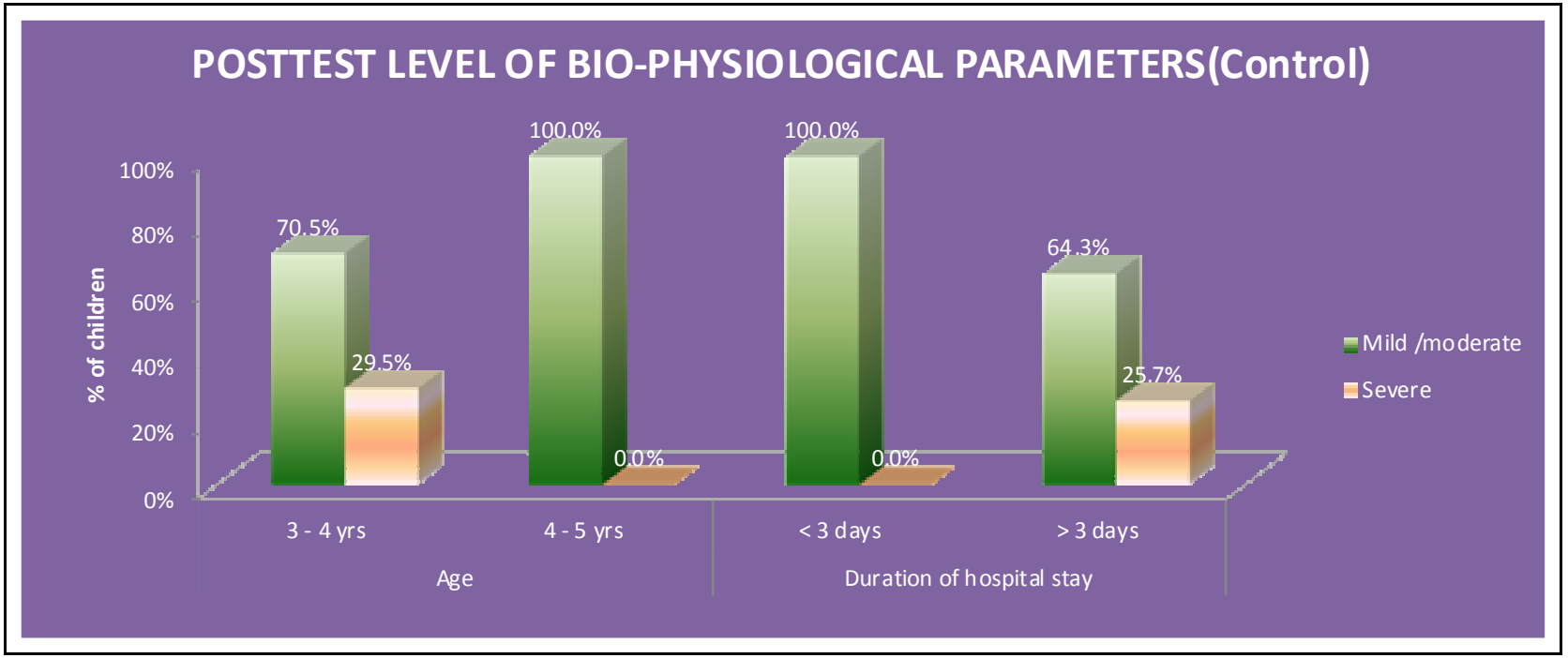
Statistical significance was analyzed using Pearson chisquare test/ Yates corrected chisquare test.

Fig-7: Post test level of Bio physiological parameters (Experimental)



The above fiqure -7 showed the association of weight of the child, exposure to passive smoking, place of living with the post test level of bio- physiological parameters in experimental group. The children with normal weight children and not exposed to passive smoking, rural children were having more normal bio physiological parameters than others

Fig-8: Post test level of bio-physiological parameters (Control)



The above fiqure 8 showed the association of age, duration of hospital stay with the post test level of bio-physiological parameters in control group. Elder children and less than 3 days duration of hospital stay during illness children were having more mild distress than others

CHAPTER-V
5.0 DISCUSSION

This study, is an attempt that has been made to identify the effectiveness of nebulisation along with postural drainage and percussion on children with selected respiratory disorders. A standard Semi structured questionnaire and a rating scale was used to assess the respiratory status. The sample size taken for the study was 60 with selected respiratory disorders.

This research study has been discussed based on the objectives and the following supported studies.

The demographic variables shows that less than half of the proportion the age of the child in experimental group (40%) and in control group (33.3%) belongs to the age between 3 - 3.5years. The weight of the children was found to be of equal proportion (80%). The duration of hospital stay for the majority was 53.3% in control group and 36.7% in experimental group who stayed for less than 3 days in hospital during illness and majority 46.7% in experimental group and 30.0% in control group stayed for 3-5 days. Concerned with the exposure of passive smoking at home the majority 66.7% in experimental Group and 76.7% in control group were not exposed to passive smoking. The place of living for the majority (66.7%) in experimental group and (60.0%) in control group lived in urban area.

The first objective is to determine the effect of nebulisation with postural drainage and percussion on respiratory status of children in experimental group

The present study revealed that there was a quick reduction in their clinical parameter distress score from 11.33 to 4.17 after the administration of nebulisation with postural drainage and percussion. Due to nebulisation with postural drainage and percussion they were able to reduce 7.16 score from base line score. Before administration of nebulisation with PD&P, 86.7% of children were having moderate distress, 13.3% of them having severe distress and none of them having normal & mild distress. After administration of nebulisation with PD&P, 16.6% of children moved to normal, 76.7% of them

moved to mild distress and 6.7% of them moved to moderate distress and none of them having severe distress. Concerned with the bio physiological parameters, in pretest none of the children had shown normal bio physiological parameter score, 12 (40.0%) showed mild to moderate and 18 (60.0%) showed severely altered BPM. In post test 13(43.3%) of children moved to normal, 17(56.7%) of children moved to mild/moderate from severely altered BPM. This reduction is statistically significant (P=0.001***). This improvement was due to postural drainage and percussion along with nebulisation. Thus the researcher concludes that the nebulisation with postural drainage and percussion was very much effective in improving the respiratory status of children with respiratory disorder. By this data hypothesis1 is accepted.

This study was also supported by ***Colin Wallis, Ammani Prasad (1999).*** On his trail he studied the need of physiotherapy. The author says that the central function of chest .physiotherapy in paediatric respiratory disease is to assist in the removal of trachea bronchial secretions. The intention was to remove airway obstruction, reduce airway resistance, enhance gas exchange, and reduce the work of breathing. He concludes that Chest physiotherapy can improve a patient's respiratory status and expedite recovery.

This study was also supported by ***TM Kaminska (1988).,*** comparing the effects of postural drainage and the administration of positive expiratory pressure as techniques of physiotherapy in the domiciliary management of patients with chronic bronchial sepsis.12 patients over a period of six weeks of conventional techniques of postural drainage being administered on one day alternating with positive expiratory pressure on the next day. Measurements have been made of sputum production during physiotherapy, He concludes that patient can demonstrate a good independent treatment with postural drainage.

Pryor JA, Webber BA, Hodson ME (1990)., also supports the study, he explains the effect of chest physiotherapy on oxygen saturation in

patients with cystic fibrosis. Active cycle of breathing techniques during postural drainage in 20 patients with cystic fibrosis he found that there was no fall in arterial oxygen saturation during the procedure.

The second objective is to assess the effect of nebulisation on respiratory status of children in control group.

On an average, children with respiratory disorder were seen with reduced clinical parameter score from 11.33 to 7.90 after the administration of nebulisation. Due to nebulisation they were able to reduce 3.27 score from base line score. Before administration of nebulisation, 90.0% of children were having moderate distress, 10.0% of them having severe distress and none of them having normal & mild distress. After administration of nebulisation, 23.3% of children had mild distress, 76.7% of them had moderate distress and none of them had normal and severe distress. This reduction was statistically significant. Statistical significance was calculated by using student's paired 't' test. Regarding bio physiological parameter score, in pretest one child (3.3%) had shown normal BPM score, 14 (46.7%) showed mild to moderate and 16(53.3%) showed severe alteration in BPM. In post test none of the children moved to normal, 25 (46.7%) of children moved to mild/moderate and 5 (53.3%) children stayed in severely altered BPM. This reduction was also statistically significant. Statistical significance was calculated by using chisquare test. It showed that improvement was due to nebulisation. Thus the researcher concludes that nebulisation alone was less effective in improving the respiratory status of children with respiratory disorder.

The study supported by ***Wg Cdr BM John. (2010)*** he states the comparison of the nebulised salbutamol with L- epinephrine in first time wheezy children. The methodology was followed for sixty children between two months to 60 months were recruited, 30 in each treatment group. Children received periodic (0, 20, 40 minutes) doses of either salbutamol laevo-epinephrine via nebuliser along with oxygen. Changes in heart rate, oxygen saturation, respiratory rate and respiratory distress assessment instrument were assessed. The results noted were the respiratory status was better in the epinephrine group.

The same was supported by ***Besbes- ouanes L, et al., (2000)***. He compare the clinical and spirometric effects of continuous and intermittent nebulisation of salbutamol in acute severe asthma. Clinical and spirometric assessment was performed at baseline, 40 minutes, 60 minutes, and at 3 and 6 hours after the start of the nebulisation. The author concludes that they did not observe an appreciable difference between continuous and intermittent nebulisation of salbutamol in acute severe asthma.

This study was supported by ***Joseph V. Doboson (1998)*** he studied the use of albuteral in hospitalised infants with bronchiolitis. This prospective, randomized clinical trial was performed. The participants for study were a total of 52 patients less than 24 months of age with a diagnosis of moderately severe, acute viral bronchiolitis. SaO_2, accessory muscle use, and wheezing were recorded and the actual period of hospital stay was also measured. Both groups showed significant improvement in oxygen saturation over time.

The third objective was to compare the respiratory status of children with respiratory disorders in experimental and control group.

In pretest, considering all clinical parameters, there was no statistically significant difference between experiment and control group. In posttest, considering all clinical parameters, there was a statistically significant difference between experiment and control group except Air entry and Capillary refill. On an average, experimental group children showed a decrease 35.8% of clinical parameter score whereas in control group children showed 16.4% clinical parameter score. Difference was 19.4%. Experimental group children benefited 19.4% than control group. This 19.4% shows the effectiveness of nebulisation with postural drainage and percussion method.

The comparitive level of Bio-physiological parameters between experiment and control group children. In pretest none of the children had shown normal bio physiological parameter score, 12 (40.0%) showed mild to moderate and 18 (60.0%0) showed severely altered BPM . In post test 13(43.3%) of children moved to normal, 17(56.7%) of children moved to mild/moderate from severely altered BPM. This reduction is statistically

significant (P=0.001***). Statistical significance was calculated by using chisquare test. It shows, in pretest there was no difference between experiment and control group children. In post test they were having statistically significant difference in heart rate and respiratory rate and no statistically significant difference seen in oxygen saturation. Thus postural drainage and percussion along with nebulisation is proved to be very much effective than nebulisation alone in improving the respiratory status of children with selected respiratory disorders.

This study was supported by ***M.Innes Asher, et al., (1990),*** this clinical article studied the effect of chest physiotherapy on lung function in children recovering from acute severe asthma. Lung volumes and flow rates was recorded by a body plethysmograph before salbutamol nebulisation and before and after either postural drainage or placebo visits in first and fourth treatments. Three 12 year old children in Physiotherapy group showed improvement in lung function.

The fourth objective is to assess the effect on respiratory status of children with selected demographic variables.

In this present study elder children (P=0.01**), underweight children (P=0.01**) and children with increased duration of hospital stay during illness (P=0.03*) and exposed to passive smoking (P=0.02*) and urban place of living (P=0.04*) were statistically significant in the experimental group.

Dr. D. J. Turner, (1993), the aim of this study was to seek such a relationship in young asthmatic children using dose-response curves. The study samples were fourteen asthmatic subjects aged 3–9 years with a forced expiratory volume. Each subject completed a DRC by inhaling 5 doses of salbutamol at 15 min intervals. The results show that all lung function parameters, Sa_{O2} and HR increased significantly. Thus the investigator suggests that the level of response to a bronchodilator increases significantly with increasing age in young asthmatics.

Shibi Chakra Varthy K., Raj B Singh, et al (2002) he estimate the prevalence of asthma in children less than 12 years of age and to study the possible differences in the prevalence of asthma in children residing in urban and rural areas of Tamilnadu. The data suggest that the actual prevalence of asthma and other 'wheezy' illnesses may be higher in urban areas of Chennai.

Dragana Nikic (1999), he discussed about the relationship between respiratory symptoms and total air pollution (indoor and outdoor). The results shows that passive smoking has significantly more influence on respiratory symptoms among preschool children.

CHAPTER-VI
SUMMARY, CONCLUSION, IMPLICATIONS, RECOMMENDATIONS AND LIMITATIONS

This chapter deals with the summary, conclusion, implication, recommendation and limitation of the study.

6.1 SUMMARY

Investigator conducted the study to assess the effectiveness of nebulisation with postural drainage and percussion on respiratory status among children with selected respiratory disorders, at Institute Of Social Paediatrics, Government Stanley Medical College And Hospital, Chennai.

THE OBJECTIVE OF THE STUDY

1) To determine the effectiveness of nebulisation with postural drainage and percussion on respiratory status of children in experimental group.

2) To assess the effectiveness of nebulisation on respiratory status of children in control group.

3) To compare the respiratory status of children with respiratory disorders in experimental and control group.

4) To associate the effect on respiratory status of children with selected demographic variables.

Review of literature was done from primary and secondary sources that formed the basis of selection of problem, formation of the tool conceptual framework and preparation of the protocol.

The conceptual framework was based on modified widenbach's helping art theory. It was an appropriate model prescribed comprehensive framework to achieve the objectives of the study.

The research design used in this study was quasi experimental research design.

The tool consisted of demographic data, respiratory status assessment includes clinical assessment - chest movements, work of breathing, chest retraction, nasal flaring, air entry, breath sounds, capillary refill test, cough, sputum nature and use of accessory muscle. Bio Physiological Measurement includes heart rate, respiratory rate and oxygen saturation. Experts validated the tool.

The pilot study was conducted after getting formal administrative permission and ethical clearance. The pilot study was conducted in the selected pediatric medical wards at Institute Of Social Paediatrics, Government Stanley Medical College and Hospital, Chennai, for the period of one week from 21.03.2011 to 27.03.2011. Formal permission was obtained from the Director, Institute of social pediatrics and Government Stanley Medical College and Hospital, Chennai-1. Eight samples (four for experimental group, four for control group) that fulfilled the inclusion criteria were chosen from the main population by using convenient sampling technique. Informed written consent was obtained from the mothers of the children whose data was collected for two consecutive days. The instrument was found reliable to proceed for the main study. The reliability was established by using Test re-test method. The study was found to be feasible. The pilot study was conducted after getting formal administrative permission and ethical clearance. The other opinion and suggestion that were incorporated in the main study was to accomplish the objectives of the study.

The main study was conducted on 60 children with selected respiratory disorders at Institute of Social Pediatrics, Government Stanley Medical College and Hospital, Chennai-1. The main study was conducted from 29.08.2011 to 29.09.2011 Chennai, for 4 weeks. The samples were selected on the basis of convenient sampling technique.

The data collected was analyzed and interpreted based on their objectives using descriptive and inferential statistics.

6.2 MAJOR FINDINGS OF THE STUDY

It showed that less than half of the study population in experimental group (40%) and in control group (33.3%) belongs to the age group of 3 - 3.5years.

The weight of the children, were in equal proportion (80%) in experimental and control group were below normal weight.

The duration of hospital stay in the majority 53.3% in control group and 36.7% in experimental group stayed for less than 3 days in hospital during illness and majority 46.7% in experimental group and 30.0% in control group stayed for 3-5 days.

The exposure to passive smoking at home a majority of 66.7% in experimental Group and 76.7% in control group were not exposed to passive smoking.

The place of living the majority (66.7%) in experimental group and (60.0%) in control group lived in urban area.

The family income consisted of 86.7% in experimental group and 80.0% in control group earned Rs.5000-7000.

The researcher concluded that the nebulisation with postural drainage and percussion was more effective in improving the respiratory status among children with respiratory disorders (P=0.001***) among the experimental group.

The researcher concluded that the nebulisation alone was less effective in improving the respiratory status among children with respiratory disorders (P=0.001***) in control group.

Nebulisation with postural drainage and percussion was found to be very effective in improving the respiratory status of children. The present study revealed that in experimental group there was a quick reduction in clinical parameter distress score from 11.33 to 4.17 after the administration of nebulisation with postural drainage and percussion. Concerned with the bio

physiological parameters, in pre test none of the children had shown normal bio physiological parameter score, 12 (40.0%) showed mild to moderate and 18 (60.0%) showed severe BPM. In post test 13(43.3%) of children moved to normal, 17(56.7%) of children moved to mild/moderate from severely altered bio physiological parameters. This reduction is statistically significant (P=0.001***). Thus nebulisation with percussion with postural drainage was more effective than nebulisation alone for children with respiratory disorders.

In this present study children with normal weight , less duration of hospital stay during illness had better improvement in respiratory status and were statistically significant both in experimental (P=0.01**) and control group (P=0.01**).

6.3 CONCLUSION

The study revealed that postural drainage and percussion along with nebulisation was very effective than nebulisation alone on day 2 evening (P=0.001***). Thus postural drainage and percussion along with nebulisation was more effective than nebulisation alone in improving the respiratory status among children with selected respiratory diseases (P=0.001***)

An improvement in the respiratory status and thereby decreasing further complication could be achieved by performing nebulisation with postural drainage and percussion among children with respiratory disorders.Thus children with respiratory diseases will benefit from the intervention in improving their respiratory status by clearing the lung secretions thereby enhancing speedy recovery and reducing the duration of hospital stay.There was a moderate significant association with their normal weight and less duration of hospital stay during illness in the improvement of the respiratory status.

6.4 IMPLICATIONS OF THE STUDY

The investigator had drawn the following implication for the study, which were vital concern in the field of nursing practice, nursing education, nursing administration and nursing research.

IMPLICATION FOR NURSING PRACTICE

- Respiratory diseases are common among children and it is curable if it is diagnosed early and treated properly. As a member of the health team, nurses play an important role in improving the respiratory status among children with respiratory diseases.

- Basic nursing practice is important to develop their knowledge and skills in performing effective postural drainage and percussion

- Nurses should create awareness among parents and children through health education about home remedies and simple intervention for respiratory illness.

IMPLICATION FOR NURSING EDUCATION

- The study has clearly proved that the postural drainage and percussion along with nebulisation was very effective in children with respiratory disorders.

- Nursing students must be posted in pulmonology wards for demonstration of postural drainage and percussion techniques on children with respiratory disorders.

- Arrange for an in service education program and staff development program on demonstration of the postural drainage and percussion techniques for the staff nurses and nursing students.

IMPLICATION FOR NURSING RESEARCH:

- Research is a never ending process of acquiring knowledge that may enhance a result on its completion. Nurses need to attend more conferences to acquire inquisitive knowledge.

- Nursing researcher can encourage clinical nurse to apply the research findings in their daily nursing care activities and can bring about new techniques in relieving secretions effectively for children with respiratory diseases.

- This study also brings about the fact that more studies needs to be conducted by comparing the nebulisation with other procedures for clearing secretions like breathing exercises, flutter therapy etc.,

IMPLICATION FOR NURSING ADMINISTRATION

- The administrator should give permission to do the various experimental study to find out the efficiency of the procedure.
- The nurse administrator should prepare the standard protocol for postural drainage and percussion techniques.
- Pamphlets, video and live demonstration regarding postural drainage and percussion techniques should be exhibited to the parents of children with chronic respiratory illness like cystic fibrosis.

6.5 RECOMMENDATIONS

The investigator recommend the nurses and administrator to provide pamphlets and demonstrate the postural drainage and percussion techniques on children with respiratory diseases in pulmonology ward, general wards and out patient department.

The study recommends the following suggestions for further research.

- Similar study can be done by other techniques of clearing secretions like breathing exercises with large samples.
- Similar study can be conducted in pediatric intensive care unit as a true experimental study.
- A descriptive study can be conducted to identify the factors that influence the respiratory status after postural drainage and percussion and nebulisation can be undertaken.
- Similar study can be conducted for school age children with respiratory diseases.

6.6 LIMITATION

Initially the children were not cooperative for postural drainage and percussion techniques.

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POSITIONS FOR POSTURAL DRAINAGE AND PERCUSSION FOR CHILDREN

STEPS OF PROCEDURE

POSITION # 1: UPPER LOBES

Apical Segments

The child sits on the flat drainage table and leans on a pillow at a 30 degree angle against the caregiver. Percuss and vibrate over the muscular area between the collarbone and the top of the shoulder blade on both the left and right sides.

POSITION # 2: UPPER LOBES

Posterior Segments

The child sits on the flat drainage table and leans forward over a folded pillow at a 30 degree angle. Stand behind the child and percuss and vibrate on the upper back on the left and right sides of the chest.

POSITION # 3: UPPER LOBES

Anterior Segments

The child lies on his or her back on a flat drainage table. Percuss and vibrate between the collarbone and nipple on both the left and right sides of the chest.

POSITION # 4: LINGULA

Elevate the foot of the table 14 inches (about 15 degrees). The child lies head down on the right side and rotates 1/4 turn backward. A pillow may be placed behind the child ([torn shoulder to hip) and the child may flex his or her knees. Percuss and vibrate just outside the left nipple area. For females with tenderness around the breasts, percuss and vibrate with the heel of hand under the armpit and fingers extended forward beneath the breasts.

POSITION # 5: MIDDLE LOBE

Elevate the foot of the table 14 inches (about 15 degrees). The child lies head down on the right side and rotates 1/4 turn backward. A pillow may be placed behind the child (from shoulder to hip) and the child may flex his or

her knees. Percuss and vibrate just outside the right nipple area. For females with tenderness around the breasts, percuss and vibrate with the heel of hand under the armpit and fingers extended forward beneath the breasts.

POSITION # 6: LOWER LOBES
Anterior Basal Segments

Elevate the foot of the drainage table 18 inches (about 30 degrees). The child lies on his or her right side with the head down and a pillow behind the beck. Percuss and vibrate over the lower ribs on the left side of the chest, as shown in the diagram. To drain the right side of the chest, the chid lies on his or her left side with the head down and a pillow behind the back. Percuss and vibrate over the lower ribs on the right side of the chest.

POSITION # 7: LOWER LOBES
Posterior Basal Segments

Elevate the foot of the drainage table 18 inches (about 30 degrees). The child lies on his or her abdomen, head down, with a pillow under the hips. Percuss and vibrate on both the left and right sides of the spine. Do not percuss or vibrate over the spine or lower ribs.

LATERAL BASAL SEGMENTS
Position # 8 & 9: LOWER LOBES

Elevate the loot of the table 18 inches (about 30 degrees). The child lies on his or her left side, head down, and leans 1/4 turn forward toward the table. The child can flex his or her upper leg over a pillow for support. Percuss and vibrate over the uppermost portion of the lower ribs to drain the right side, as shown in the diagram. To drain the left side, the child lies on his or her right side in the same position. Percuss and vibrate over the uppermost portion of the lower left ribs.

POSITION # 10: LOWER LOBES
Superior Segments

The child lies on his or her abdomen on a flat drainage table with two pillows under the hips. Percuss and vibrate over the middle part of the back at

the bottom of the shoulder blade on both the left and right side of the spine. Do not percuss or vibrate over the spine.

QUESTIONNAIRE

SECTION –A

DEMOGRAPHIC VARIABLES:

SAMPLE NO:

DATE OF ADMISSION:

DIAGNOSIS:

1. Age of the child

   a. 3 - 3.5years b. 3.6 - 4 years

   c. 4.1 – 4.5 years d. 4.6 – 5 years

2. Sex of the child

   a. Male b. Female

3. Immunization status

   a. Up to date
   b. Post dated
   c. Irregular
   d. Delayed due to illness

4. Weight of the child

   a. Below normal b. Normal c. Above normal

5. Previous episode of respiratory infection

   a. First episode
   b. 2- 3 episodes
   c. 4-5 episodes
   d. More than 5 episodes

6. Frequency of hospitalisation

   a. First time
   b. 2- 3 times
   c. 4-5 times
   d. More than 5 times

7. Duration of hospital stay during illness

   a. Less than 3days
   b. 3-5days
   c. 6-7days
   d. More than7days.

8. Child's exposure to passive smoking at home

   a. Exposed b. Not exposed

9. Place of living

   a. Rural b. Semi urban c. Urban

10. Family income

   a. Less than 5000 per month

   b.5100 - 7000 per month

   c. Greater than 7100 per month

SECTION – B

RESPIRATORY STATUS ASSESSMENT: 1. CLINICAL PARAMETERS

Clinical parameters	0	1	2	Day 1	Day2
Chest movements	Symmetrical	Less symmetrical	Unequal		
Work of breathing	Normal	Difficulty	Noisy		
Chest retraction	No retraction	Intermittent	Continuous		
Nasal flaring	Absent	Intermittent	Continuous		
Air entry	Bilateral	Unilateral	Nil		
Breath sounds	Normal vesicular breath sounds	Wheeze	Crepts, Severe wheeze		
Cough	No cough	Intermittent	Persistent		
Capillary refill	< 2seconds	> 3seconds	> 4seconds		
Sputum nature	No sputum	Thin mucoid	Thick purulent		
Use of accessory muscle	Nasal breathing	Mouth breathing	Strenuous muscle breathing		

SCORE:

0 – Normal

1- 7 – Mild distress (35%)

8 - 14 – Moderate distress (36-70%)

15 - 20 – Severe distress (71-100%)

2. BIO-PHYSIOLOGICAL PARAMETERS

PARAMETERS	DAYS	MORNING		EVENING	
		Before Intervention	After Intervention	Before Intervention	After Intervention
HEART RATE	D1				
	D 2				
RESPIRATORY RATE	D1				
	D 2				
OXYGEN SATURATION	D1				
	D2				

BIO-PHYSIOLOGICAL PARAMETERS (BPM)

Heart rate

90-110 beats/minute - 0 (Normal)

Above 110 – 124 beats/minute - 1 (Tachycardia)

Above 124 beats/minute - 2 (Severe tachycardia)

Respiratory rate

24-30 breaths / minute	-	0 (Normal)
Above 30- 44 breaths /minute	-	1 (Tachypnea)
Above 44 breaths /minute	-	2 (Severe tachypnea)

Oxygen Saturation (SaO2)

91 – 100%	-	0 (Normal SaO2)
85 – 90 %	-	1 (Low SaO2)
Less than 85%	-	2 (Very low SaO2)

Score:

0	-	Normal BPM
1-3	-	Mild/ Moderately altered BPM
4- 6	-	Severely altered BPM

நேர்முக காணல் படிவம்

பகுதி – அ

புள்ளி விவர ஆய்வு :

மாதிரி எண் :

மருத்துவமனையில்
அனுமதிக்கப்பட்ட நாள் :

நோயின் பெயர் :

1) குழந்தையின் வயது

அ) 3-3.5 வயது ☐

ஆ) 3.6-4 வயது ☐

இ) 4.1-4.5 வயது ☐

ஈ) 4.6-5 வயது ☐

2) குழந்தையின் பாலினம்

அ) ஆண் ☐

ஆ) பெண் ☐

3) தடுப்பபூசி கொடுத்த விவரம்

அ) குறிப்பிட்ட தேதியில் கொடுக்கப்பட்டது ☐

ஆ) குறிப்பிட்ட தேதிக்கு பிறகு ☐

இ) விட்டு விட்டு கொடுக்கப்பட்டது ☐

ஈ) நோயினால் தள்ளிப் போனது ☐

4) குழந்தையின் வயதிற்கு ஏற்ற எடை பற்றிய விவரம்

அ) குறைந்த எடை ☐

ஆ) சரியான எடை ☐

இ) அதிகமான எடை ☐

5) முந்தைய சுவாச சம்பந்தப்பட்ட நோயினால் பாதிக்கப்பட்ட விவரம்

அ) முதல் முறை ☐

ஆ) 2-3 முறைகள் ☐

இ) 4-5 முறைகள் ☐

ஈ) 5 முறைக்கு மேல் ☐

6) மருத்துவமனையில் அனுமதிக்கப்பட்ட விவரம்

அ) முதல் முறை ☐

ஆ) 2-3 முறைகள் ☐

இ) 4-5 முறைகள் ☐

ஈ) 5 முறைகள் மேல் ☐

7) நோய்வாய்பட்ட போது மருத்துவமனையில் இருந்த நாட்கள்

அ) 3 நாட்களுக்கு குறைவான நாட்கள் ☐

ஆ) 3-5 நாட்கள் ☐

இ) 6-7 நாட்கள் ☐

ஈ) 7 நாட்களுக்கு மேல் ☐

8) வீட்டில் மறைமுகமான புகைபிடித்தலுக்கு குழந்தை உட்பட்டுள்ளதா?

அ) ஆம் ☐

ஆ) இல்லை ☐

9) வசிக்கும் இடம்

அ) கிராமம் ☐

ஆ) புறநகரம் ☐

இ) நகரம் ☐

10) குடும்பத்தின் மாத வருமானம்

அ) 5000 குறைவாக ☐

ஆ) 5100-7000 ☐

இ) 7100க்கு மேல் ☐